NETWORK WORLD
THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING
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Building a better mousetrap

Alantec packs more punch into new PowerHub 7000.

Feature	PowerHub 5000	PowerHub 7000
Slots	5	Up to 20
Ethernet segments	12	240
Dedicated Ethernet ports	76	456
FDDI rings	2	8
Backplane capacity	400M bit/sec	Up to 3.2G bit/sec

Alantec powers up new high-end switching hub

BY SKIP MACASKILL

San Jose, Calif.

Alantec Corp. this week is expected to roll out a next-generation backbone switching hub that combines the fault-tolerant features of a chassis-based system with the configuration flexibility of a stackable hub.

The PowerHub 7000 Series will enable users to scale port density, performance and backplane capacity as their needs change and avoid the expense of a fully loaded high-end system before they are ready.

"We'll definitely evaluate the 7000 based on the higher density and greater fault tolerance over the existing [Alantec] PowerHub 5000," said Richard Patton, an Alantec user and telecommunications engineering specialist at Southern Company Services, Inc. in Birmingham, Ala. "The ability to add as we go is also an attractive feature."

According to sources familiar with Alantec's

See **Hubs**, *page 56*

SPECIAL TELETOON INSIDE

Forget about sending the kids to camp this summer. *You* need a break from the headaches at work. Pack your bags for lovely Camp Datacomma, where things are really rolling.

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Messages waiting: Vendors at work on a universal in-box

E-mail, voice mail and fax companies to establish interoperability specs.

BY ADAM GAFFIN

Chicago

Electronic mail, voice mail and fax vendors this week will sit down for the first time to begin hammering out specifications for supporting universal in-boxes that could ultimately give users a single interface to all types of messages.

The goal is to develop standards to ensure compatibility among the various message types and infrastructures, said Ron Rassner, chairman of the Electronic Messaging Association's (EMA) Interoperability Committee, which is hosting the meeting.

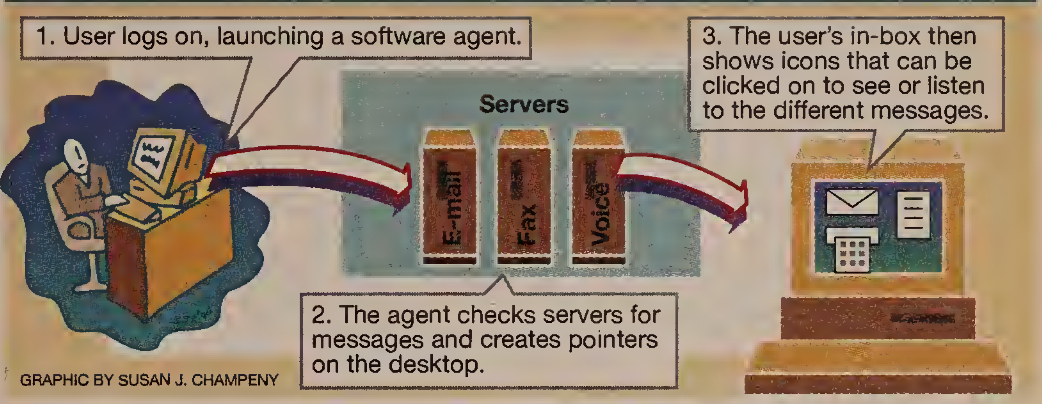
The voice mail industry developed interoperability standards several years ago but failed to attract E-mail vendors.

Last year, the Universal Messaging Interoperability Group (UMIG) devised draft standards for moving voice messages across Simple Mail Transfer Protocol nets using the Multi-purpose Internet Mail Extensions (*NW*, June 13, page 33).

The EMA hopes to pick up where UMIG left off, said Rassner, who is also vice presi-

See **In-box**, *page 56*

All together now: How universal in-boxes will work



1. User logs on, launching a software agent.
2. The agent checks servers for messages and creates pointers on the desktop.
3. The user's in-box then shows icons that can be clicked on to see or listen to the different messages.

GRAPHIC BY SUSAN J. CHAMPENEY

One user's frame relay ship comes in

BY JOANIE WEXLER

Arlington, Wash.

While many users look to frame relay to handle their bursty local network traffic, U.S. Marine/Bayliner turned to it simply to save piles of money.

The $350 million boat maker has migrated its Systems Network Architecture net from AT&T private lines to WilTel's frame relay service. The firm's choice had little to do with gaining the ability to occasionally burst above a minimum committed information rate (CIR), since SNA is not bursty in nature.

Instead, the motivation was the half-million dollars in savings the company expects over the next five years, largely in line costs, said Clay Elting, director of information systems.

Elting said his firm's digital frame relay links cost 70% less

See **Frame relay**, *page 57*

HIGH-SPEED NETS

ATM pricing emerges — hold onto your wallets

BY BILL BURCH

Washington, D.C.

Prices for wide-area Asynchronous Transfer Mode (ATM) service are starting to trickle in, and it ain't cheap, folks.

AT&T, Sprint Corp. and WilTel are selling ATM by contract, putting together bids based on items such as the number of nodes to be served. But even though users can expect term and volume discounts, they can also expect to pay considerably more for ATM than traditional leased lines.

Although AT&T will not have a commercial ATM service until the fourth quarter, it currently has several beta customers trialing native ATM transport. In Oregon, several universities and institutes have set up the Network for Education and Research to test ATM for applications such as telemedicine and distance learning.

See ATM, *page 57*

Fore! ATM leader pitches campus, WAN switches

BY SKIP MACASKILL

Warrendale, Pa.

ATM market leader Fore Systems, Inc. last week broke out of the workgroup arena with the introduction of its next-generation family of ATM switches designed for campus and wide-area network environments.

The four models in the ForeRunner ASX-200 line improve on the company's existing ASX-100 by offering higher port density, hot-swappable modules, dual power supplies, and support for a range of industry and ATM Forum standards, including Version 3.0 of the User-to-Network Interface (UNI).

"A lot of people didn't take Fore seriously because it was perceived as a LAN switch vendor," said Scott O'Hare, network systems designer and a Fore user at Cablevision Systems Corp. in Woodbury, N.Y. "We were forced to look at other vendors for larger switches, but this announcement means we can stop looking."

The ASX-200 is an en-

See **Fore**, *page 56*

Reality Check

✓

The skinny on the ForeRunner ASX-200 line of ATM switches. See page 56.

NEWSPAPER

Briefs

Digital cuts again. Digital Equipment Corp. last week said it will cut 20,000 jobs over the next 12 months and restructure its divisions in a bid to save $1.8 billion a year. Two new divisions, the Computer Systems Division and the Components Division, each include several business groups that will continue Digital's workstation and networking product lines. The new Advanced Technology Group will develop products for both mobile and multimedia computing.

One small step. Novell, Inc. this week is expected to bring out NetWare 4.02, the bug-fix upgrade to NetWare 4.01 that has been expected. Users testing the product confirmed that it is just a maintenance release, although Novell did significantly improve the performance of the NetAdmin utility.

Long-distance romances. The Federal Communications Commission last week unanimously approved BT's purchase of a 20% stake of MCI Communications Corp. for $4.3 billion. Meanwhile, IDB Communications Group, Inc., a Culver City, Calif., long-haul carrier, last week said it has entered discussions with fellow long-haul carrier LDDS Communications, Inc. of Jackson, Miss. Talks are in the preliminary stages, but if a deal comes off, it could result in one of the biggest long-haul carriers in the U.S.

Wireless wedding. MCI Communications Corp. ally Nextel Communications last week signed an agreement to acquire Onecomm Corp., a move that extends Nextel's wireless network reach. Nextel, which agreed to buy Onecomm for $650 million in stock, is trying to build a nationwide wireless network. Onecomm has wireless licenses in 23 states.

All RMON is not created equal. Results of Remote Monitoring (RMON) interoperability tests completed earlier this month at the SNMP Test Summit II will be presented to the Internet Engineering Task Force meeting in Toronto next week. Fifteen vendors took part in the test, which uncovered a number of ambiguities in the RMON specification that resulted in several interoperability problems. The difficulties center around how RMON tables are set up and how to resolve issues when multiple Simple Network Management Protocol-based management stations have access to a single RMON agent.

A route to Windows. Wellfleet Communications, Inc. and Microsoft Corp. last week announced an agreement to bind Wellfleet's router/bridges with Microsoft's Windows NT servers and workstations. Developments will include Network Basic I/O System Name Caching for Internet Protocol, improved Dynamic Host Configuration Protocol support for Windows NT and integrated management.

Middle of the road. Informix Software, Inc. is expected to announce soon a nonexclusive agreement to resell Information Builders, Inc.'s EDA/SQL middleware. It can be used to access more than 100 data sources.

Donning a Tuxedo. Oracle Corp. last week said it will integrate its Cooperative Development Environment (CDE) application development tools with Transarc Corp.'s Encina, Novell, Inc.'s Tuxedo, and AT&T Global Information Solution, Inc.'s Top End TP monitors. Oracle will codevelop the links with the TP monitor firms and make the links available free of charge by year end. Oracle said the tighter integration between CDE and TP monitors will enable more CDE application users to share a single database server.

Chicago conference. The Windows User Group Net (WUGNET) will host an on-line conference with Microsoft Corp. product managers covering Chicago on WUGNET's WINUSER Forum. Chicago is Microsoft's new version of Windows. The 90-min. conference will be held July 20 at 8:30 p.m. EST.

WUGNET: (215) 565-1861.

Contacts

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This week's *Network World* explores document management systems that enable you to pan for strategic gold in them thar hills of documents buried across the enterprise.

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Network HELP *desk*

Network World *tracks down answers to your questions regarding products, services, technologies or disputes with vendors. Please submit questions to Dana Thorat at (800) 622-1108, via fax at (508) 820-3467, via the Internet at djt@world.std.com or via CompuServe at 73244,2673.*

In December 1993, we attempted to install SunSoft, Inc.'s SunLink Frame Relay Version 1.0 software on our Sun Microsystems, Inc.'s machines as part of our university's satellite and terrestrial network project. We immediately encountered problems in setting up the link and called Sun's technical support department. The support representative, who claimed to be unfamiliar with frame relay, was unable to help.

As our project deadline approached, we repeatedly called Sun's technical support department and then finally called their upper management, but to no avail. We were also informed that our free software support time period had since expired. Can you help us get some competent technical support from Sun or suggest some other frame relay products that will run on our Sun machines?

Haisong Cai, College Park, Md.

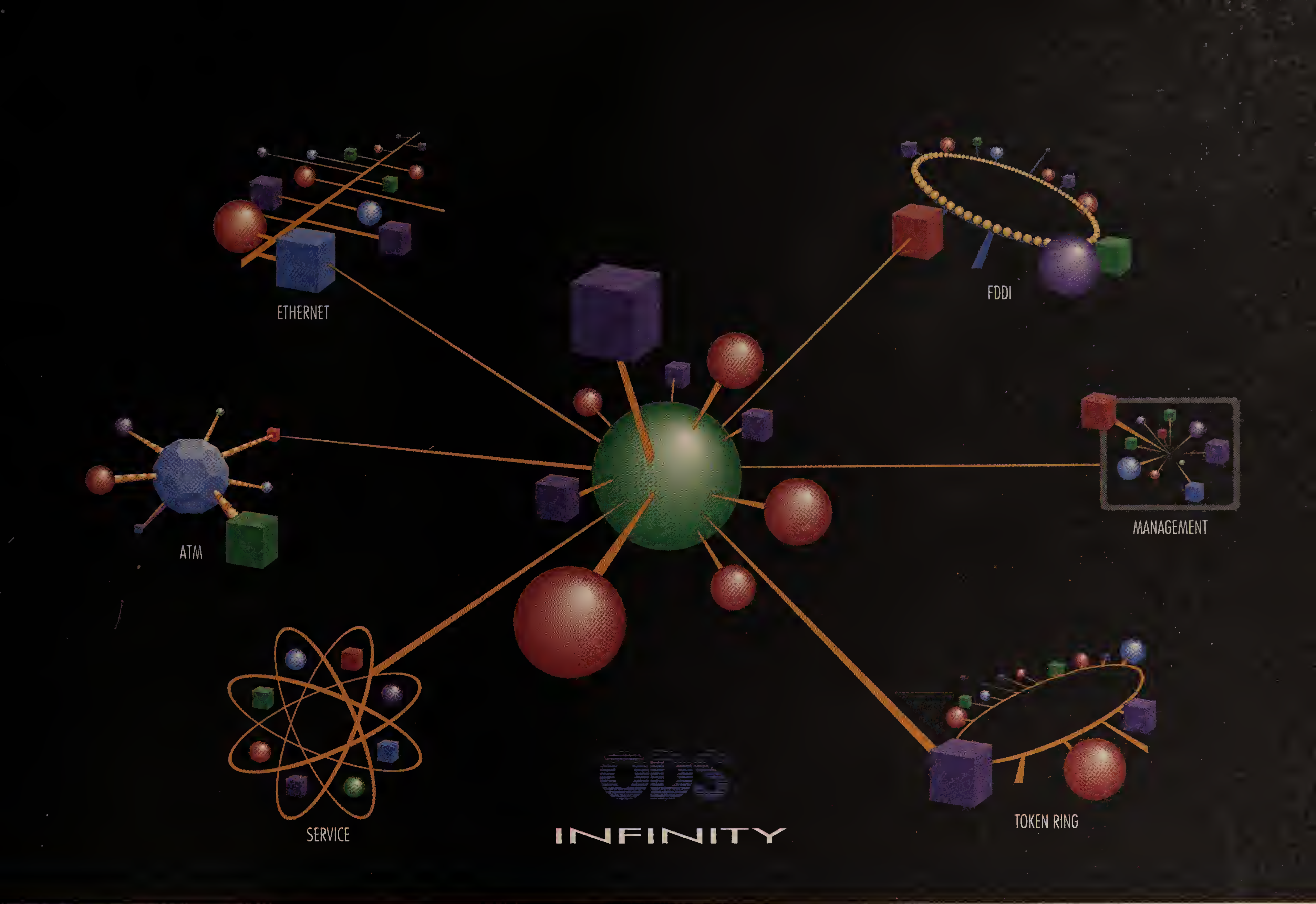
NW contacted Sally Brandon, a Sun spokeswoman, who contacted Sun's North American Solutions Center, the worldwide support center for Sun hardware and software. Several weeks later, a Sun technical support representative remotely logged on to the university's network, performed some tests and successfully configured the frame relay software. He also assisted Haisong Cai with the proper cable setup.

In March, after four months of frustrating attempts to get Sun's Frame Relay software working, Cai finally received the technical support he needed to get his software up and running. In addition, Sun honored Cai's free software support warranty.

"I am still surprised that Sun Service, the only official technical help center known to most customers, could not help us at all," Cai said. He added that Sun's North American Solutions Center turned out to be a great help, however, and is pleased with the final outcome of the situation.

Can you tell me which vendors support Kerberos network security software for IBM RS/6000 AIX or

See Help desk, *page 44*



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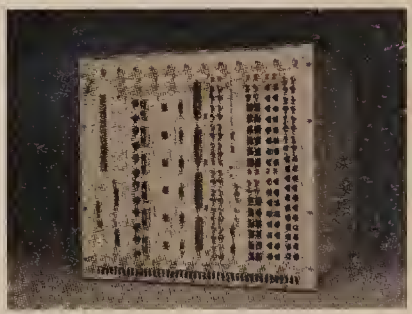

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Going the acquisition route

Company	Cisco	Newport Systems	Combined
1993 fiscal year revenue (in millions)	$649	$25 (approximately)	$674
Employees	2,200	55	2,255
Primary products	Backbone, access and branch office routers; and communications servers	Software based routers	Backbone and remote access routers
Management	John Morgridge, president and CEO	Larry Stephenson, president and CEO	Morgridge, President and CEO; Stephenson, Cisco VP and Newport general manager

Newport Systems acquisition key to helping Cisco extend net presence

BY JIM DUFFY

San Jose, Calif.

Cisco Systems, Inc. last week said it is acquiring remote site router vendor Newport Systems Solutions, Inc. as part of a broad strategy to serve users' needs beyond the enterprise backbone network.

Newport Systems will help Cisco port its Internetworking Operating System (IOS), which currently comes intertwined with proprietary hardware on all Cisco routers, to a variety of personal computer platforms and network operating systems (NOS). This will help Cisco drive its routing technology out to the periphery of corporate networks.

Newport Systems makes routing software that runs on Intel Corp.-based platforms and works with Novell, Inc. NetWare and other NOSes. It has an installed base of some 20,000 systems.

Cisco will take advantage of Newport Systems' presence on these platforms by integrating IOS, or at least parts of it, with Newport Systems' technology.

PARTNERING WITH VENDORS

In addition to working with Newport Systems, Cisco has established partnerships with some 20 vendors to produce 50 manifestations of IOS to run on a variety of network components, said Cisco Vice President of Marketing Don Listwin.

Cisco's goal is to make IOS a de facto standard ''network operating system'' for enterprise internetworking, he said.

''Our challenge is to allow customers to keep IOS'' as they migrate from router-based internetworks to those based on switches, Listwin said. ''The whole set of code isn't needed in all places, but the richness will always be maintained.''

Cisco's challenge should also be to stay focused, according to users.

''They seem to be going all over the place now,'' said Imran Bashir, manager of systems integration at Unitel Communications, Inc. in Toronto. ''Where is their focus?''

Cisco officials tried to clear things up by outlining four key areas for IOS infiltration: core backbone infrastructures, campus workgroups, access requirements and IBM Systems Network Architecture/local-area network integration.

With a 50% share of the multiprotocol routing market, Cisco's IOS is well established in backbone internetworks. But as users swap out their backbone routers for switches, Cisco will emphasize IOS as the key software component for those switches to maintain compatibility with the shared-media LAN world.

For workgroup penetration, Cisco will ship an IOS-based Catalyst switching hub in the next 60 days, Listwin said. Cisco acquired Catalyst last year when the company bought Crescendo Communications, Inc.

Cisco is also expanding its partnerships with hub vendors Cabletron Systems, Inc. and Chipcom Corp. to make IOS an integral software component of those vendors' next-generation LAN switches.

For the remote access arena, in addition to the Newport Systems deal, Cisco is looking to incorporate IOS into devices that support 28.8K bit/sec V.34 and Integrated Services Digital Network dial-up access to public and private networks. This will be targeted at mobile users, telecommuters and those needing access to LAN internetworks, Listwin said.

Cisco is also looking to meld IOS with Unix, Novell NetWare and Windows NT servers, Listwin said. The company is already well along in developing an IOS-based routing card for Windows NT servers, and Newport Systems engineers are expected to help finish the product, a Cisco spokesman said.

For the IBM space, meanwhile, Cisco's channel-attached routers are now in beta sites and are slated for controlled release in September.

Listwin claims Cisco's channel-attached router can run 10 times faster than an IBM 3172 Interconnect Controller and can replace an IBM 3745 front-end processor.

He said Cisco is also looking at adding NetWare-to-SNA gateway capabilities to the channel-attached routers, which would allow users to run Novell's Internetwork Packet Exchange protocol natively to the data center, obviating the need for a gateway at the remote branch office. It would also alleviate the requirement for Source Route Bridging and Data Link Switching, Listwin said. ◼

INTERNET *tip*

BY ADAM GAFFIN

One in a series of occasional tips on Internet-based information services.

Router info

Cisco Systems, Inc. maintains an Internet service that provides:

- ✓ **Product specifications**
- ✓ **Software patches**
- ✓ **Service and support information**
- ✓ **Company press releases**

To access:
Use telnet to connect to cio-sys@cisco.com.

Emory University will trial private cellular net

BellSouth to install PBX, CDPD cell on campus.

BY ELLEN MESSMER

Atlanta

Emory University will serve as the first beta site for a private Cellular Digital Packet Data (CDPD) and cellular voice network service provided by BellSouth Corp. that will support mobile communications among medical professionals on campus.

The carrier will install a wireless private branch exchange and equipment supporting CDPD data transmissions on the Emory campus here and charge a flat rate for both types of private cellular service. Emory hopes to give nurses and doctors the ability to take calls and access information on the go while avoiding the high cost of traditional cellular service.

> **"We are taking a cautious approach to the CDPD market until we have a nationwide CDPD network in place. But we see a lot of opportunities for private networks."**

''In the larger world of cellular, you're billed 35 cents per minute airtime for voice calls,'' said Jeff Dunbar, Emory administrator on the health communications project. ''Here we're looking at a flat-rate fee.''

CUTTING COSTS

Emory and BellSouth have yet to work out that rate for both voice and data cellular service, but the goal is to trim costs significantly, Dunbar said. BellSouth will actually own the on-campus cellular net and will contribute its expertise in installing and maintaining the equipment for free in exchange for Emory playing the role of beta site.

BellSouth plans to market similar private cellular services under the brand name Cosmos. Unlike some other cellular carriers, BellSouth has not yet announced CDPD on a subscription basis to the general public, and the Emory private net represents a novel toe-in-the-water approach to the technology.

''We are taking a cautious approach to the CDPD market until we have a nationwide CDPD network in place,'' said William Warford, BellSouth product manager for inbuilding wireless systems. ''But we see a lot of opportunities for private networks.''

The Allen Telecom Systems Division SmartCell wireless PBX — which is only being sold directly to cellular carriers — connects directly to an existing wireline PBX so the user's cellular and desk telephone ring at the same time.

The system works with standard analog cellular phones so users can make calls off-campus, as well, if they are signed up for regular cellular service. ''But if users are within the building, they will be billed under the monthly flat rate,'' Warford said.

By year end, Emory's voice network will be extended campuswide, at which time the private CDPD network will be added to let health care providers transmit medical data from laptop and hand-held devices to the hospital's mainframe. BellSouth is now selecting the CDPD base stations and routers it will install.

Dunbar said Emory's staff will adapt current applications, such as the mainframe-based clinical data repository, to work with CDPD.

David Bernheisel, senior radio frequency engineer at Allen Telecom, said the cellular PBX now supports as many as 60 users, but within two months will be upgraded to support several hundred.

One concern at Emory is ensuring that cellular equipment does not interfere with medical equipment.

''We'll be testing cellular in an area where we use a lot of telemetry equipment,'' Dunbar said. ''Our initial tests indicate there is no significant interference, but we want to be sure before we use this on a continued basis.''

Ira Brodsky, an analyst at Wilmette, Ill.-based Datacomm Research, said the BellSouth service is similar to Southwestern Bell Corp.'s FreedomLink service based on the Panasonic Corp. cellular PBX.

But Mike Watson, BellSouth senior product development engineer, pointed out there are significant differences between the two services.

Southwestern Bell's customers buy the Panasonic equipment for FreedomLink, and Southwestern Bell maintains control over the wireless PBX through a ''keep-alive'' signal that terminates cellular service if necessary, Watson said.

Southwestern Bell's lawyers determined that selling equipment and controlling it in this manner on Southwestern Bell frequencies satisfies rules set by the Federal Communications Commission for proper use of allocated spectrum.

''But our attorneys have a different opinion, that if the equipment operates in our frequencies, we have to own it,'' Watson noted. ◼

CLARIFICATION

A recent article (*NW*, July 4, page 1) misidentified the positioning of IBM's upcoming client/server electronic mail and groupware product. The product will compete with Microsoft Corp.'s Exchange and Lotus Development Corp.'s Lotus Communications Server. IBM will continue to resell Notes, with which the IBM product will not compete, the company said.

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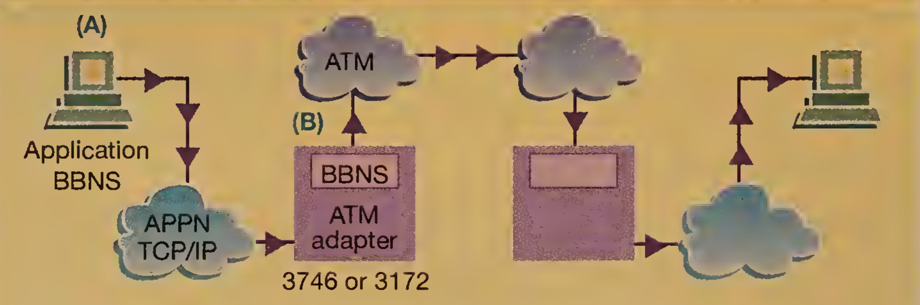
IBM reveals hardware and ATM strategy

BY MICHAEL COONEY

Boston

Making use of BBNS over ATM



IBM is looking to exploit its BBNS technology on existing hardware and software. BBNS could (A) reside in desktop applications that would reserve bandwidth across an ATM network on their own, or (B) it could reside on the 3746 or 3172, where it would reserve ATM bandwidth for an application.

GRAPHIC BY TERRI MITCHELL

IBM may deploy a key piece of ATM software on its FEP and controllers, as well as deliver new ATM-enabled applications that will help users migrate to the high-speed networking technology and give them the ability to dynamically allocate bandwith on an application-by-application basis.

Executives at IBM's 1994 APPC/APPN Technical Conference held here last week said IBM is exploring how to bring its BroadBand Network Services (BBNS) software to the 3746 front-end processor and 3172 Interconnect Controller, as well as integrate BBNS code in new Asynchronous Transfer Mode-enabled applications.

McGEE

That would let IBM customers bring two of the most widely used and expensive pieces of their Systems Network Architecture net gear into the ATM environment and let the machines support both legacy and new ATM applications.

BBNS is the technology implemented in the BroadBand Switch Control Program that runs IBM's new family of Nways ATM switches (*NW,* June 27, page 1). BBNS provides ATM access and transport services as well as net flow and congestion control. Analysts point to BBNS as the key technology that will make IBM's ATM strategy fly.

According to Frank Dzubeck, president of the Communications Network Architects, Inc. consultancy in Washington, D.C., IBM is looking at how ATM will affect applications on the perimeter of the net, beyond the backbone.

"The question is how to regulate data flow from the end point in a network, not just on the backbone," he said.

"We are looking for a way to expand the ATM backbone we are building with our Nways ATM switches to include 3746 and 3172 controllers and applications," said Rick McGee, director of IBM's controller lines. "We want to give user applications the ability to request bandwidth for a certain period of time and have BBNS set it up automatically through the net."

BANDWIDTH DIRECTOR

On the 3746 and 3172, which would be outfitted with ATM adapters, BBNS would recognize an application's request for communication, determine the bandwidth it would need and direct it across the ATM backbone to its destination as fast as possible. Also, since BBNS can support frame relay and circuit emulation services, it could also direct SNA/Advanced Peer-to-Peer Networking or other data traffic to its proper destination over an ATM backbone.

CONGESTION CONTROL

Since the primary role of BBNS is bandwidth management, it could guarantee priority and congestion control across all the ATM devices in the net. In the other scenario, IBM would implement BBNS in application code, letting an application on a net end station automatically request bandwidth from the net for a certain period of time.

McGee cited IBM's Person to Person multimedia application as a product that could take advantage of this implementation almost immediately. Person to Person lets as many as eight users share images, text and full-motion video across an local- or wide-area net environment.

With BBNS, Person to Person could reserve a certain amount of bandwidth on its own without having to request it from a controller or switch, or without having bandwidth manually predefined by a network administrator as is required today.

"Obviously, users would like to see new applications [adapted] to take advantage of ATM, but existing applications might also be able to use this," said Steve Joyce, director of IBM's APPC Market Enablement Group.

Analysts said IBM is only beginning to explore how its BBNS technology can change the way bandwidth is doled out across an enterprise. In today's environments, there is little bandwidth flexibility.

"BBNS will be able to intelligently slice and dice bandwidth in ways users never could before," said Anura Guruge, an independent consultant based in New Ipswich, N.H.

Whether application data flows are regulated by BBNS on a controller or from and end-user application, the key will be cost, said Ron Sanderson, manager of software and support for the state of Illinois. "This situation will put a lot more pressure on net administrators to set rules on who has access to what," Sanderson said. "Even if the end user has direct access to a 45M bit/sec link, can he pay for that? Not likely." ◪

REGULATORY RELIEF

Southwestern Bell seeks long-distance approval

BY BILL BURCH

Washington, D.C.

Southwestern Bell Corp. last week asked the Justice Department to back its effort to supply out-of-region long-distance service through separate subsidiaries.

If the Department of Justice approves the carrier's waiver request, Southwestern Bell will go to U.S. District Court Judge Harold Greene for final approval.

If permission is granted by Greene, Southwestern Bell could put its new freedom to immediate use providing inter-local access and transport area service to cellular customers of its Southwestern Bell Mobile Systems, which operates in Chicago and the Northeast. Southwestern Bell could also provide long-distance service in Montgomery County, Md., where it plans to offer residential phone service over a cable TV net.

The carrier has no plans to offer general long-distance service across the country.

Southwestern Bell's request comes shortly after the carrier joined the other regional Bell holding companies in asking for a repeal of the Consent Decree that broke up AT&T. That decree includes restrictions on the Bells from offering long-haul service.

By pursuing out-of-region long distance on its own, Southwestern Bell may be able to gain some regulatory relief before its broader attack on the Consent Decree with the other Bells reaches a conclusion, a company spokesman said.

Southwestern Bell argued that in offering out-of-region long-distance service, it would not be able to use its control of the local loop in Texas and four other states to discriminate against rival long-distance carriers.

For long-distance calls into its own region, Southwestern Bell offered to hand off traffic to another long-distance provider. Southwestern Bell and other Bells currently can supply long-distance service overseas as long as they hand off traffic before it crosses the U.S. border, the carrier pointed out.

To prevent cross-subsidization of out-of-region long-distance service by local service ratepayers, Southwestern Bell said it would do business through separate subsidiaries. By staying outside its own region and working through separate subsidiaries, unfair competition in long distance would be impossible, the carrier told the Justice Department.

Once Southwestern is in long distance, other Bells would quickly follow its lead and seek to provide out-of-region long-distance service, the carrier predicted. Overall, out-of-region long distance for the Bells will mean increased competition in the market as a whole, the company said. ◪

Focus on next generation of IP tops IETF agenda

BY MICHAEL CSENGER
AND ELLEN MESSMER

Toronto

The next-generation Internet Protocol debate will come to a head next week when the Internet Engineering Task Force (IETF) convenes here to announce how it will overcome the protocol's limited network address space.

IP must be updated, among other reasons, because it was not originally designed to handle the huge number of addresses needed to meet soaring Internet and private Transmission Control Protocol/Internet Protocol network usage.

Three possible replacement proposals, referred to by their acronyms SIPP, TUBA and CATNIP, have been under consideration for three years by the IETF, which oversees Transmission Control Protocol/Internet Protocol standards development. Sources last week said the recommendation for what is known as "IP, the next generation" (IPng) will not be for any one proposal, but rather, a combination.

"We're taking two out of the three as the basis for our recommendation," said Allison Mankin, cochair of the IP Next Generation Area. Her group is under the IETF's technical arm, the Internet Engineering Steering Group. Mankin declined to name which two protocols are being picked and which one dropped.

It would not be surprising to see Simple Internet Protocol Plus (SIPP) and TCP/IP-UDC over Big Addresses (TUBA) make the final cut, observers said. Common Architecture for Next Generation Internet Protocol (CATNIP) is most likely to be dropped, they said. No matter which protocol or protocols are chosen, IPng's voluntary implementation on the Internet and in private nets could require a change in routers, end systems and applications on a huge scale.

> **It would not be surprising to see SIPP and TCP/IP-UDC over TUBA make the final cut, observers said.**

"It has to go to every end station, eventually," said Tom Golway, chairman of the Enterprise Network Roundtable's Transitions Strategies working group and director of new technology for GCE Consulting Inc. in New York.

The IPng announcement next week will put a stake in the ground for IPng by citing specific features, such as security and wireless communications, that will form its foundation, Mankin said.

Work on TUBA has been done by individuals at Los Alamos National Laboratories, Cisco Systems, Inc. and Wellfleet Communications, Inc. TUBA's addressing structure is based on the robust Open Systems Interconnection standard the Connectionless Network Protocol.

Thomas Nolle, president of consultancy CIMI Corp. in Voorhees, N.J., said TUBA is also compliant with the E.164 addressing scheme, an international standard used in public Asynchronous Transfer Mode, Switched Multimegabit Data Service and frame relay networks. SIPP and the current version of IP are not E.164 compliant, he said.

SIPP was developed at Xerox Corp., Sun Microsystems and Digital Equipment Corp., among others. Unlike TUBA, it uses fixed-length field sizes.

Mankin last week said the upcoming announcement will define transition for users of both TCP/IP and OSI nets to IPng, as well.

Comments?

See "Contacts" box on page 2.

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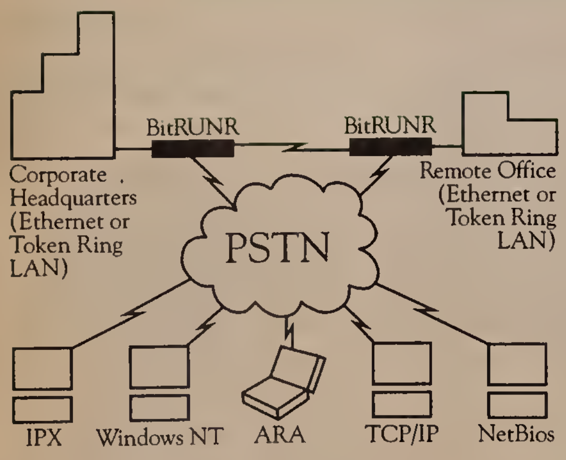
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Sprint's flat-rate plan may come with some hitches

BY DAVID ROHDE

Kansas City, Mo.

Users lured by the promise of simplified pricing for long-distance may want to tread carefully before buying into Sprint Corp.'s new Real Solutions pricing plan — the first flat-rate tariff program offered by one of the Big Three carriers.

Announced last week, Sprint's Real Solutions program is targeted at businesses with 100 to 1,000 employees, and combines consulting and billing services along with long-haul pricing that does not vary by mileage or time of day. The program is designed to boost the carrier's market share in the small to midsize business segments.

Real Solutions sampler

Per-minute rates for users who commit to a 2-year term. Rates apply to all interstate calls, regardless of mileage.

Voice calls		
Monthly volume commitment	**Switched access cost (in cents)**	**Dedicated access cost (in cents)**
$2,000	20.6	14.9
$5,000	19.8	14.3
$10,000	18.7	13.6
$20,000	17.8	12.9

Data calls		
Monthly volume commitment	**Switched access cost (in cents)**	**Dedicated access cost (in cents)**
$2,000	23.7	16.3
$5,000	22.7	15.7
$10,000	21.5	14.8
$20,000	20.4	14.1

But while carrier officials touted the simplicity of the pricing, Sprint's initial publicity materials failed to reveal customers must commit to a two-year term and a volume commitment of at least $2,000 a month to get the flat rate.

The rates, beginning at 20.6 cents per minute and working down for larger volume commitments (see graphic), are substantially higher than second-tier carriers' flat-rate pricing as well as flat rates in Big Three contract tariffs and other special deals.

For example, LCI International, Inc. offers daytime rates of 17.2 cents per minute for switched access and 11.9 cents for dedicated access with no volume or term commitments. With volume commitments, the LCI rates drop even more, said Marketing Director Jon Finseth.

"[The rates] are a good 2 to 3 cents higher, but it makes doing the math very easy," said Mark Langner, an analyst with TeleChoice, Inc. in Verona, N.J.

"That may be worth a penny or two to the customer," he added.

Sprint officials painted Real Solutions as a new approach to the business market that is designed to help businesses make money rather than save money, said Sprint Business Group President Kevin Brauer.

Customers can call a Dallas Business Center staffed by management consultants from Electronic Data Systems Corp. (EDS) who can provide business — rather than network-oriented — information such as average cost of sales in a particular industry. The Business Center will produce reports comparing an individual business' figures with industry averages.

But such general management and sales advice is of marginal value, said Christine Heckart, a TeleChoice analyst. "You don't call Sprint or EDS if you want to talk about your business strategy or setting up an accounting program," she said.

Locally based account teams are the best place to offer consulting, said Jack Duffy, product manager for AT&T's UniPlan midsize business offering.

"We have no knowledge of customers wanting to receive consulting on a removed basis," he said. "And the consulting we offer is related to technology."

LCI takes a similar approach, Finseth said.

"Can you really give people just plain-vanilla information and call it consulting?" he said.

Sprint contends the consulting services provide an added-value that raises Real Solutions above simple discount plans.

"If I go out and offer the cheapest price, I'll more than likely lose the customer [when someone else beats the price]," said Alex Battey, director of targeting and segmentation for Sprint's Business Services Group. "I'm in a death cycle unless I offer some value."

Real Solutions also offers access to Sprint's FONView electronic billing system. AT&T has been offering bills on disk or CD-ROM to the middle market for nine to 12 months, Duffy said. AT&T also offers midsize 800 customers a special program to help them determine where to locate and staff call centers, he said.

©Sprint Real Solutions: (800) 816-7325.

DISTRIBUTED COMPUTING

Vendor to demonstrate object interoperability

BY ADAM GAFFIN

San Francisco

Four object request broker (ORB) vendors said interoperability will be in the cards at next week's Object World trade show here.

Iona Technologies, Ltd., Fujitsu, Ltd., PostModern Computing, Inc. and SunSoft, Inc. will demonstrate how their ORBs can work together by letting show attendees play an object-based game of poker over a net supporting the vendors' products.

While these four vendors may have the most unusual ORB demonstration at the show, they will not be alone in announcing interoperability. Covia Technologies, Inc., Digital Equipment Corp., Expersoft, Inc., Hewlett-Packard Co., IBM and Microsoft Corp. will also make interoperability-related announcements at the show.

ORBs maintain information, such as names and locations of objects, used by distributed applications over a net.

The Object Management Group's Common ORB Architecture (CORBA) has emerged as a standard in building distributed object networks but does not specify how ORBs from different vendors should talk to each other. CORBA 2.0 will provide those standards when it comes out this fall, but until then, vendors are racing to show that different ORBs can work together.

IBM and HP, for example, are expected to demonstrate interoperability between IBM's Distributed System Object Model and HP's ORB+.

HP is also expected to show how object offerings from its various divisions can work together. These include tools for writing "objectized" Distributed Computing Environment and relational database applications.

Digital and Microsoft will show off their draft specifications for linking Microsoft's desktop object technology with Digital's ORB, dubbed ObjectBroker 2.5. The companies announced these last week, several months later than originally promised. The specifications will give Microsoft entry into the CORBA world, as ObjectBroker is CORBA-compliant, while users of ObjectBroker will gain access to Windows desktop applications.

Also, Expersoft and Covia will announce a plan to integrate Expersoft's XShell ORB with Covia's Communications Integrator middleware.

Iona, meanwhile, will demonstrate prototype software for linking Microsoft's Object Linking and Embedding desktop technology with Iona's ORBs across a network.

Microsoft itself has announced plans for OLE-based desktop-to-network object communications in its non-CORBA-compliant Cairo operating system, due out next year.

All the interoperability demonstrations could prove to be good news for users struggling to find a coordinated object solution, said Tim Harmon, director of application development strategies at META Group, Inc., a consultancy in Burlingame, Calif. Not to be overlooked is action by vendors, such as HP, to show that their own products work together, he said.

"It's just been this confusing jumble," he said.

IBM offers APPC app suites

BY MICHAEL COONEY

Boston

IBM last week announced a suite of software intended to help users employ its APPC communications facility to support a range of basic networking requirements.

The new APPC Application Suite bundles six products with functions ranging from Advanced Peer-to-Peer Communications-based file transfers to support for 3270 datastreams over APPC connections. In the next few months, all the software will be incorporated into new revisions of key IBM operating systems, such OS/2, OS/400 and MVS, as well as third-party products from Wall Data, Inc. and others.

Users will also have the option of buying and running individual pieces of the suite on top of existing platforms and tweaking them according to their own requirements.

"We want to enable users in a distributed APPC environment to be able to perform everyday network tasks in a reliable, consistent way," said Steve Joyce, director of IBM's APPC Enablement Group in Raleigh, N.C.

APPC is the application program interface (API) to IBM's LU 6.2 session type, which is used for peer-to-peer communications in a Systems Network Architecture net.

The Application Suite includes the APPC File Transfer Protocol (AFTP), which provides a mechanism for listing and transferring files between workstations on an SNA net. Until now, users had to purchase a separate file-transfer product, such as LEGENT Corp.'s XCOM product, to do file transfers in an APPC environment. The suite also includes the APPC 3270 Protocol (A3270), which, for the first time, lets 3270 devices access host resources over APPC connections.

"A3270 is for casual 3270 connections between two machines needing to exchange 3270 data," Joyce said. "For example, A3270 only supports LU 2 communication, not LU 2 printers or LU 0 banking devices."

That makes A3270 different from IBM's dependent LU Requestor (dLUR) technology, which supports thousands of 3270 net devices and all dependent LU traffic in Advanced Peer-to-Peer Network nets, which use LU 6.2 as the underlying communications mechanism.

The APPC Name Server (ANAME) is a directory server that lets users assign, query and delete nicknames, instead of using SNA's more formal and cumbersome Logical Unit name. Nicknames can be assigned to users, groups of users or transaction processing applications. For example, the term "database server" could replace a 20-plus character SNA LU name.

"We want to enable users in a distributed APPC environment to be able to perform everyday network tasks in a reliable, consistent way."

The last three components, APPC Connectivity Tester (APING), APPC Tell Program (ATELL) and APPC Remote Command Executor (AREXEC), were previously available as separate program products from IBM over the CompuServe net.

APING is an application that allows individual workstations to verify net connections with other workstations on an SNA net before commencing communications. It also supplies simple performance measurements and reports error data if a session cannot be established.

ATELL and AREXEC are utility programs that let APPC users exchange messages and execute commands on remote workstations, respectively.

One large APPC user who requested anonymity said his firm has to build features like APING and ATELL on its own, which leads to of nonstandard APPC-based communications.

"Having them included under the covers will be a great help," he said.

According to Anura Guruge, an independent consultant based in New Ipswich, N.H., IBM is finally deploying a standardized way for APPC users to communicate in larger, more complex environments. "What's surprising is how long they've taken to do it."

Developers' source code is available for the Application Suite. pricing was not announced.

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If you like the front of our new hubs, wait until you see the back. That's where you'll find their unique expansion slot, and proof of their unprecedented flexibility. Buy the HP AdvanceStack today and you get a low-cost solution for your current setup. Then when you want additional functionality, all you need is a cost-effective expansion module, not a new unit. Add a lifetime warranty* backed by HP's reputation for quality and reliability, and we think you'll want to find out more about AdvanceStack right away. For fast faxed information, call **1-800-964-0714**, or for a full product brochure, **1-800-533-1333, Ext. 8117.**† And discover why so many people are looking in back of the stack–AdvanceStack, that is.

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- MTBF: 274,000 hours (12-port model)
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PEER-TO-PEER NETWORKING

3Com enhances NetBuilder II router with APPN NN support

BY JIM DUFFY

Santa Clara, Calif.

3Com Corp. this week will announce software that gives its NetBuilder II support for Advanced Peer-to-Peer Networking Network Node (APPN NN) routing over frame relay backbones.

With its APPN 7.1 software, 3Com claims it is the first router vendor other than IBM to offer APPN NN support. Cisco Systems, Inc. is not expected to support it until next year, and Wellfleet Communications, Inc. may announce APPN NN this fall.

Earlier this year, 3Com offered APPN NN to users free of charge for evaluation purposes, or "proof of concept," said Philippe Byrnes, 3Com product manager for Systems Network Architecture internetworking.

But its performance lagged, and it didn't run over frame relay nets. With many SNA users looking at frame relay as a way to lower line costs and improve bandwidth utilization, 3Com is now well positioned to accommodate those that are also migrating to the "New SNA."

APPN

3Com was 1 of 6 vendors to complete an APPN NN interoperability test at IBM's Research Triangle Park, N.C., labs in June. Other participants included Wellfleet and IBM.

IBM also supports APPN NN over frame relay on its 6611 router.

TARGETING AS/400 USERS

The company figures that the best place to start looking for those users is the Application System/400 base because APPN code has been shipping for years as part of the AS/400 operating system.

"That's the right market to target initially," said Val Sribar of META Group, Inc. in Westport, Conn. "I'm still not convinced that the rest of the world is really going to go with APPN yet."

3Com said its APPN NN implementation will improve the performance of AS/400 minicomputers and reduce wide-area networking costs. Off-loading network node processing to the NetBuilder II will free up the AS/400 to become more efficient at its core application processing chores.

Networking costs will be reduced by replacing Synchronous Data Link Control circuits with frame relay connections. This will save users up to 40% in their wide-area networking costs by replacing low-speed leased SDLC lines with frame relay circuits priced at a distance-insensitive rate (see story, page 1).

APPN 7.1 costs $3,995 and will be available in August.

3Com also plans to ship in November an upgrade to APPN 7.1 that supports Data Link Switching (DLSw). DLSw was designed by IBM to tunnel legacy SNA and Network Basic I/O System traffic through an Internet Protocol backbone.

DLSw will be positioned as an option to the Logical Link Control 2 tunneling that 3Com currently supports in NetBuilder II.

Next year, 3Com will add support for IBM's dependent LU Requestor, which allows legacy SNA traffic to traverse APPN nets without modification, and High Performance Networking (HPR).

HPR increases throughput and decreases the memory requirements for routing in large APPN nets and is a building block for running APPN over Asynchronous Transfer Mode nets.

©3Com: (408) 764-5000.

Micom to introduce high-end NetRunner bridge/multiplexer

BY MICHAEL CSENGER

Simi Valley, Calif.

Micom Communications Corp. today will announce a high-end addition to its NetRunner bridge/multiplexer line that will let users more easily build larger networks and concentrate traffic at core sites.

The NetRunner 2000E supports a total wide-area bandwidth of 384K bit/sec divided among six ports. The existing 1000E also has six ports but with only 256K bit/sec combined throughput, which limits the device to about four WAN ports in common configurations.

Micom's NetRunner held the biggest share (24.4%) of the 1993 remote Ethernet bridge market. Micom ranked 8th in 1992 with a 5.6% share, but moved up as other vendors refocused on routing, according to International Data Corp.

"The 2000E effectively doubles the size of networks that can be deployed, and also makes it much simpler for users to concentrate traffic on one node where before they may have required multiple devices," said Ken Guy, Micom's vice president of corporate strategy and business development.

The NetRunner integrates voice, fax, data and local net traffic over a single circuit, and uses compression to essentially let voice and fax calls ride free over data lines. It uses a cell-based multiplexing technique, called Microband ATM, to mix different types of traffic over low-speed links, typically at 56/64K bit/sec or less.

While Asynchronous Transfer Mode cell-relay encounters inefficiencies when used at such speed, the Micom approach uses much smaller cells and can guarantee low delays without excessive overhead, Guy said.

The NetRunner incorporates a single Ethernet attachment user interface or Thinnet interface for connecting an Ethernet LAN. The device also functions as a learning bridge that automatically identifies all addresses on the LAN and forwards other traffic across the wide-area link.

It has one dedicated WAN port and five others that can be used either for wide-area links or synchronous/asynchronous local interfaces. As many as three optional Voice/Fax Modules can be added, each with two ports. The NetRunner supports voice compression down to 4.8K bit/sec, and data compression as high as 8:1, Guy said.

Hilton Grand Vacations Co., a time-share developer based in Orlando, Fla., now uses four NetRunner 1000Es and 10 of the smaller 500E units. The Grand Vacations network stretches from Orlando down Florida's west coast and also links multiple locations in Las Vegas, Dallas and Indianapolis.

"At clustered locations, we have to daisy-chain some of the smaller units to get the port capacity we need," said Kim Kreiger, Grand Vacations' MIS manager. Now the company can use the 2000E instead, each of which can replace four smaller boxes that can be deployed elsewhere to support network growth.

"We'll really get a lot of bang for our buck," Kreiger said, noting that Grand Vacations installed its 1000E units in this fashion last year. "It's a very nice way to grow your network."

All NetRunner products use the same interchangeable modules and are fully interoperable with Micom's Marathon line. The Marathon is a similar product without Ethernet LAN support.

Available now, the 2000E costs $9,900. The 1000E still costs $7,250.

©Micom: (805) 583-8600.

CyberSpeak: *Voices from the reader network*

How will the Wellfleet-SynOptics merger affect the network industry?

◆ "Traditionally, when agreements have been made between router and hub vendors, there's always been issues with getting full-fledged multiprotocol router functionality inside of a hub. SynOptics tried it with Cisco [Systems, Inc.] a while back, and that didn't work out. By becoming part of the same company and not just forming an alliance, there's more of a drive for Wellfleet and SynOptics to fully integrate their products."

Louis Cureau, senior telecommunications specialist, ENTERGY, New Orleans

◆ "Wellfleet and SynOptics would create a broader product line than Wellfleet's had in the past. That's always been a limiting factor of Wellfleet."

Todd Handel, network engineer, Telephone Data Systems/Computing Services, Madison, Wis.

◆ "Will the merger alter our net plans? It depends on the new products that emerge down the road. We reevaluate every couple of years, so if this new company has products out when we do our next evaluation, we will certainly look at them. SynOptics, however, would have to do something really drastic to its line to get us to switch back."

Amin Tejani, systems analyst, Kaiser Permanente, Atlanta

◆ "This merger is not a big concern of mine except in terms of whose house is going to get cleaned and how that will affect the contacts I've come to rely on over the years."

Eric Epstein, corporate network manager, Bose Corp., Framingham, Mass.

Next Week CyberSpeak Out!

Will "anytime, anywhere" computing and communications ruin summer vacations in the future?

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INTERNET *tip*

BY ADAM GAFFIN

One in a series of occasional tips on Internet-based information services.

Moving objects

The Object Management Group runs an ftp server with information about the future of distributed object computing. Resources include documents and specifications related to the group's Common Object Request Broker Architecture and related proposed services.

Component Integration Laboratories maintains a similar ftp site with documents related to its work on the OpenDoc compound-document architecture.

To access:
Use anonymous ftp to connect to omg.org or cil.org. Log on as anonymous and use your E-mail address as a password.

Gaffin can be reached via the Internet at agaffin@world.std.com.

REMOTE NETWORKS

CrossComm unwraps mgmt. services, software

BY JIM DUFFY

Marlborough, Mass.

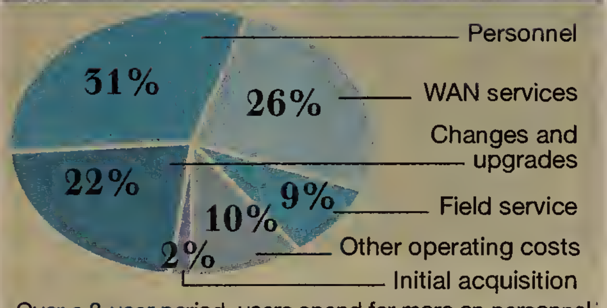
CrossComm Corp. last week unveiled a software and services package designed to lower the cost of installing, operating and troubleshooting remote office networks.

Dubbed Virtual On-site Technology (VOT), the package includes a new version of CrossComm's Internetworking Management System (IMS), an internally developed help desk and call-tracking system for CrossComm service personnel, and a new end-to-end management service offering that includes use of both new products.

The new products and services are intended to address some sticky issues inherent with remote site management, such as keeping track of problems at a branch office and how to get tools there to fix them.

"Over 50% of the time, the problem has nothing to do with the router," said Mary Kirson Satloff, CrossComm's vice president of marketing. "So we won't stop at the router."

Remote network cost breakdown



Over a 3-year period, users spend far more on personnel and maintenance for remote office nets than equipment. CrossComm's VOT is designed to reduce some of those costs.

SOURCE: STRATEGIC NETWORKS CONSULTING, INC., ROCKLAND, MASS.

For end users, CrossComm unwrapped IMS Version 7.1. IMS is a Simple Network Management Protocol management platform, based on Hewlett-Packard Co.'s OpenView for Windows, for managing CrossComm's routers.

Today, IMS supports protocol decode and analysis, end-station inventory management, event filtering, connectivity testing and mapping. Version 7.1 now allows users to monitor wide-area network links, manage the hub modules of CrossComm's XL routers and scroll through event logs of specific devices to determine the root cause of a fault.

CrossComm officials said the next release of IMS — Version 7.2 — will support the Remote Monitoring (RMON) Management Information Base, which will provide greater detail on the behavior of traffic on distributed Ethernet and token-ring local-area network segments.

IMS 7.1 costs $5,995 for a single-user license and is available now. Version 7.2 with RMON will be available in September for $11,995 per single-user license.

New services under VOT include a help desk and call-tracking system developed by CrossComm called ExpertHelper. ExpertHelper consists of a client application component on a user's IMS console and a server module on an IMS system at the CrossComm service representative's site.

When the user's IMS console detects a fault, it issues an electronic mail command to alert the CrossComm service provider. ExpertHelper can route problem alerts to appropriate service personnel and escalate alerts.

Analysts said VOT is part of a CrossComm strategy to focus on the branch office environment.

"Where CrossComm has been successful is in companies that have large SNA networks that have many locations," said Rick Malone, principal of Vertical Systems Group in Dedham, Mass. "So they've been very good at branch support to date, as opposed to the backbone site, simply because the [CrossComm high-end] ILAN router just doesn't address back-room requirements."

VOT services and ExpertHelper capabilities are available now. Prices for the remote services start at 8% of the purchase price for CrossComm routers, plus the full cost of IMS 7.1 or 7.2. ExpertHelper costs $9,495, in addition to the cost for VOT services.

©CrossComm: (508) 481-4060.

BRIEFS

IBM users can receive an 18% discount on the single-unit purchase price of new IBM **3745/3746** front-end processor models if orders are placed before Dec. 9. The discount promotion is good on any 3745/3746 upgrades or add-on features. The 3746 Model 900 is excluded from this promotion.

Also, for a limited time, users can save $475 on the purchase of IBM's new **NetView for Windows** management program. Orders placed before Dec. 30 and installed by March 31, 1995 will cost $1,420 a copy, down from $1,895.

IBM: (800) 426-2255.

CKS North America this September will ship **security products** for communications between IBM MVS mainframes and IBM LAN Server or Novell, Inc. NetWare local nets. The products, NC-PASS NetWare and NC-PASS LAN Server, provide password validation and end-user authentication during remote logon requests via an Advanced Program-to-Program Communications interface.

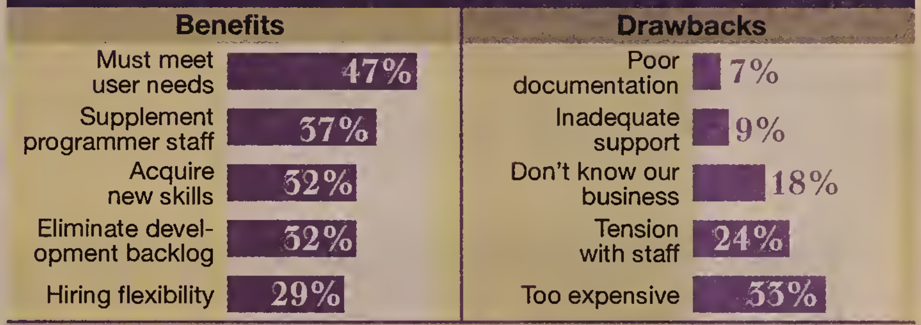
CKS North America: (412) 928-3300.

JCPenney Company, Inc. last week announced that its inventory management, gift registry and customer service operations will be upgraded with a $12 million client/server net designed by JCPenny with **AT&T Global Information Solutions**.

Engage Communications, Inc. last week announced price cuts and new protocol support on its **ExpressRouter** line of wide-area Ethernet routers. ExpressRouters now support frame relay, Point-to-Point Protocol, Transmission Control Protocol/Internet Protocol and AppleTalk. Available with one to three serial ports for wide-area network connections, pricing starts at $1,795 for one port, plus $500 for each additional port.

Engage: (408) 688-1021.

What are the benefits and drawbacks to outsourcing?



Figures are based on a survey of 50 companies involved in outsourcing issues.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: FORRESTER RESEARCH, INC., CAMBRIDGE, MASS.

Memorex-Telex steps into outsourcing arena

Makes play as enterprise net service provider.

BY MICHAEL COONEY

Boston

Memorex-Telex Corp. this week will announce a comprehensive set of outsourcing services that will transform the company from a network product vendor to an enterprise network service provider.

At the heart of the firm's new business strategy is its Advanced Services offering, which encompasses network design, implementation, management, monitoring, diagnostics and training services for large users looking to build multiprotocol enterprise networks or downsize an existing Systems Network Architecture net.

"Downsizing and corporate reengineering have forced users to deal with integrating legacy SNA applications and multiplatform, multivendor equipment — a job many are ill-prepared to do," said David Scranton, director of technology for Memorex.

COMPETITION

By entering the outsourcing market, Memorex joins a crowded field, but one where opportunities remain. Dataquest Worldwide Services Group, a research firm in Framingham, Mass., said outsourcing firms raked in $13.7 billion in 1993, a figure that will grow to $27.2 billion by 1997.

Outsourcing firms raked in $13.7 billion in 1993, a figure that will grow to $27.2 billion by 1997.

"Those numbers reflect the fact that users need help designing, building and running today's networks," said Jeffrey Kaplan, a director with Dataquest.

For Memorex, that help will come via Advanced Services, which comprises four parts: Strategic Services, Integration Services, Performance Control and Education Services.

With Strategic Services, users get help in planning, designing, building and managing a full-scale enterprise environment. Under this offering, Memorex engineers would work with the user to decide everything from what wiring to run in the walls to the protocol mix on the backbone, Scranton said.

"Even if we weren't the prime contractor to build the network, we would offer design analysis or other services to help the contractor build and run an efficient network," Scranton said.

To provide the service, Scranton said Memorex will draw on its expertise in the SNA environment — the firm is one of the largest suppliers of SNA controllers and terminals — plus its relationship with Novell, Inc. and others.

MEMOREX-NOVELL

In 1991, Memorex formed a partnership with Novell to integrate Novell's local net products with Memorex SNA technologies. Memorex now has more than 300 Novell Certified Novell Engineers (CNE) or Enterprise CNEs (ECNE) on staff.

Memorex also has partnerships with Data General Corp., Fujitsu, Ltd. and Intel Corp.

Integration Services will provide users the connectivity software and hardware that will bring together multivendor platforms. The service would also provide hardware and software upgrades to existing products so they can be integrated into the new environment.

Performance Control helps users keep nets operating smoothly. With this service, Memorex will monitor, diagnose and correct net problems from its Network Control Centers (NCC) in Tulsa, Okla., and Sydney, Australia. Today, NCCs are used to service existing users of Memorex SNA products.

Finally, Memorex will offer up Education Services to train users on their new enterprise networking equipment.

Users can contract with Memorex to buy all or part of the Advanced Services suite. Pricing is based on a per-user

See **Outsourcing**, *page 18*

ANSI president details standards process

Also says discussions to bring the IETF under ANSI banner are in the works.

Q&A Standards have long been a hot topic in networking circles, and ANSI has been at the center of many a standards battle.

In a recent roundtable discussion with the press, ANSI President Sergio Mazza fielded questions from *Network World* Senior Washington Correspondent Ellen Messmer about the group's current challenges. He cited the need for greater user and vendor involvement in the global standards process, and chided Novell, Inc. and Microsoft Corp. for lack of participation in U.S. efforts to influence international standards.

Mazza also acknowledged ANSI's strained relations with other standards groups, including the European Telecommunications Standards Institute (ETSI) and the Internet Engineering Task Force (IETF), and talked about efforts to work more closely with the IETF.

Why should users be concerned about the standards process?

Standards are really about global market access and strategic corporate advantage. The ANSI committee T1 works closely with the State Department in representing U.S. interests at the International Telecommunication Union. Committee X3 developed the C and C++ programming languages. One of the key ANSI standards developers is the IEEE committee for the 802 LAN standard, a basis for both the Internet and OSI.

The IETF is not yet an officially recognized standards body, but the standards it creates are often quickly implemented by the vendor community. What's the relationship between the IETF and ANSI?

MAZZA

The IETF is really a wonderful group that has been very innovative. We are now engaged in conversation with this group about how they can become a part of the voluntary standards process.

Some in the IETF want to become part of ANSI, some don't. We would love the IETF to become part of ANSI, but they have to understand there are principles they would have to conform to, such as openness and due process.

What is ANSI's relationship with ETSI, the organization based in France that is setting equipment and service standards made mandatory by the European Commission?

The relationship we have with ETSI is usually good, but it's not perfect. There are times when European interests push it into a Eurocentric approach to problem solving. There's a strong influence in ETSI of the old PTTs. They're slowly privatizing, but they're used to a monopoly role. We believe the intellectual property rights rules ETSI has proposed will apply to its standards are unfair to the patent holders.

Are there sectors of industry that have not traditionally been a part of the ANSI standards process but should be?

Probably a traditional sector that has not been involved in standards is the cable industry. We need national standards for this.

How do you respond to critics who maintain that the standards-setting process is too slow?

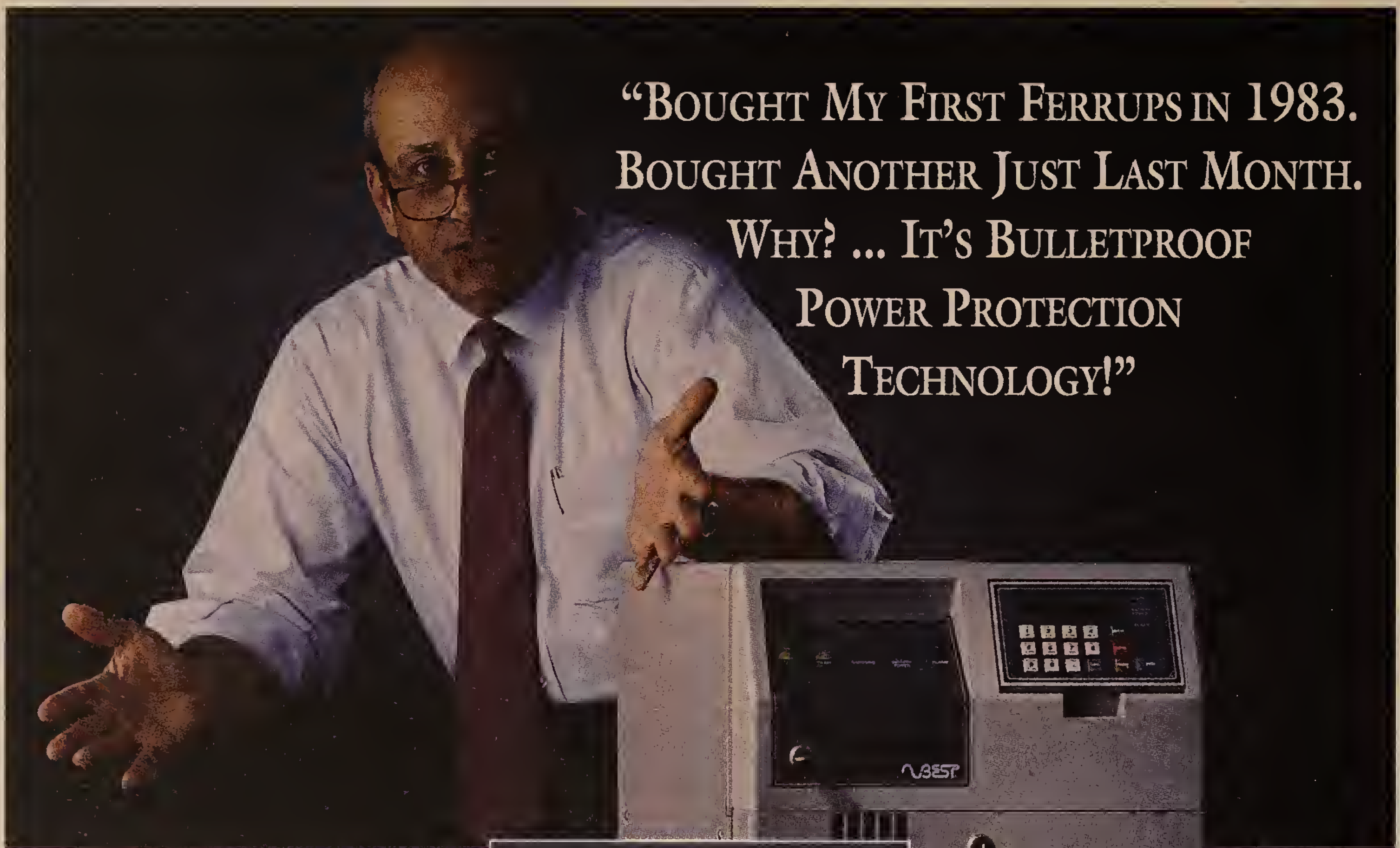
The technical work takes a lot of time, and there are a lot of companies working together. In many cases, the process is too slow. But T1 is an outstanding example of success. However, industry has often been slow to adopt ANSI standards. This is where the IETF has excelled.

Some of the newer giants of industry, including Microsoft and Novell, are often accused of attempting to forge de facto standards on their own, effectively skirting the standards bodies. What's your take on that?

Microsoft and Novell are not active in the standards industry. The older giants — Digital, IBM and Unisys [Corp.] — have always participated, and they still do. All the traditional software languages were standardized.

I wish companies like Microsoft would wake up and realize that in the area of user interfaces, these are also basically generic Windows. I think there would be a lot to gain to have a standard interface. We need enlightened self-interest. That's what drives these companies to the standards table. **Z**

Comments?
See "Contacts" box on page 2.



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Application	Principal Task	Duration	Bandwidth Required
Enterprise Networks	Network Consolidation	Variable	▬ ▪ – ■ ▪
Residential Networks	Video Services	Periodic	■ ■ ■
Community Networks	Distance Learning	Periodic	▬ ■ ▬
Carrier Backbone	High Capacity Switching & Transport	Variable/ Periodic	■

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provide vast, centralized storage as your business grows larger.

And while most servers are complicated, the ProSignia VS can make your life easier. Our optional CD-based SmartStart simplifies the whole process of setting up a reliable system. And Insight Manager (also an option) keeps an eye on key parts, pinpointing problems *before* they can disrupt operations.

Of course, the ProSignia VS also provides the security of Compaq's three-year on-site warranty** and 24-hour support line.

To find out how you can give your company more agility as it grows, visit an authorized Compaq reseller. If you'd like more information, or if you'd like the name of your nearest reseller, call us at 1-800-638-8258, ext. 450. We can show you the best kind of office manager: One that works as hard as you do.

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Copyright comments

The "Intellectual Property and National Information Infrastructure" draft report can be obtained on the Internet via Gopher at iitf.doc.gov in the Speeches, Testimony and Documents directory or via modem at (202) 501-1920. Comments about the report should be submitted by Sept. 28.

Feds look at copyright law

BY ELLEN MESSMER

Washington, D.C.

To encourage publishing on the Internet, the Clinton administration is pushing for changes to current copyright law that would forbid unauthorized distribution of electronic works.

Proposed amendments to the Copyright Act would make it illegal for a user to distribute to even one acquaintance any electronic material obtained via a public or private network.

Since electronic mail would be covered by the law, it would also be illegal to post or resend E-mail without the author's permission.

The proposal, outlined in the recently released "Intellectual Property and National Information Infrastructure" draft report, could force businesses and their information system staffs to do a better job informing end users about what is acceptable behavior when exchanging E-mail and accessing on-line services, observers said.

In announcing the legal changes that the administration will ask Congress to back, Secretary of Commerce Ronald Brown said they are needed to encourage commercial distribution of educational and entertainment works in electronic form over the national information infrastructure.

Karen Hunter, vice president and assistant to the chairman at Elsevier Science B.V., a publisher of academic books, said that in principle, the proposal sounds like something her firm would like.

Elsevier is pioneering electronic distribution of science journals to a dozen universities over the Internet. Like all publishers, the firm worries that users downloading electronic books can easily send unauthorized copies of them to others, Hunter said.

Secretary of Commerce Brown: The Information Superhighway needs copyright protection.

But Elsevier recognized that nets appear destined to augment, if not supplant, the role of libraries. The firm has worked with universities to establish site licenses for use of electronic works on campus.

"It's still early, but so far we have no evidence of...copyright violations," Hunter said.

However, ClariNet Communications Corp. of Cupertino, Calif., which distributes news stories and syndicated columns over the Internet, last month stopped distributing Mike Royko's and Dave Barry's columns due to copyright issues.

Bruce Lehman, commissioner of Patents and Trademarks and chairman of the administration's Intellectual Property Rights Working Group, said the fundamental recommendation is to recognize that users transmitting a work over the Internet are, in essence, physically distributing a copy of it.

➾ Senior Writer Adam Gaffin contributed to this article.

Outsourcing

Continued from page 13

basis, Scranton said, but he provided no pricing guidelines.

Analysts said Memorex will focus on handling the networking needs of small to midsize firms that lack the experience or resources to handle a burgeoning net environment.

"It's a tough job for many users to integrate LANs, and Memorex does have the experience — particularly with their Novell relationship — to make LAN integration easier," said Wayne Kernochan, director of commercial systems research for the Aberdeen Group, Inc. consultancy here.

The key to Memorex's success in outsourcing game will be shaking its tarnished image, added Kaplan. The firm in March emerged from a major restructuring, and its profits have been down significantly in the past few years.

"Memorex does have an image problem, but they do have a huge installed base and solid mainframe storage and SNA experience, so users shouldn't feel totally uncomfortable going to them for net services," Kaplan said.

©Memorex: (214) 444-3500.

Digital is making TCP/IP promises MultiNet has already delivered.

According to Digital, "Some of these features will appear over the next two years."
–Network World
May 16, 1994

√ Synchronized VAX/Alpha AXP releases
√ Security via Kerberos authentication
√ NFS lock manager
√ POP mail server
√ ALL-IN-1 mail interface
√ SLIP and CSLIP dialup interfaces
√ Cluster load balancing
√ Menu-driven configuration utility
√ Improved NFS management and performance
√ NFS over TCP
√ X Windows transport gateway
√ X Windows display manager
√ X Windows font server
√ Multicast support
√ MTU path discovery
√ Support from the development team
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BRIEFS

Grand Junction Networks, Inc. and **NetWorth, Inc.** last week agreed to establish a strategic partnership to bring **100M bit/sec Ethernet** technology to NetWorth intelligent hubs. Grand Junction will license its fast Ethernet adapter technology and repeater chipset to NetWorth for use in future NetWorth products, which are expected in the first quarter of 1995.

Grand Junction: (800) 747-3278; NetWorth: (800) 544-5255.

Fluke Corp. last week announced that users of its 670 Token Ring LANMeter test tool can receive a free upgrade that adds Transmission Control Protocol/Internet Protocol support; a station log for as many as 4,096 media access control, IP or Internetwork Packet Exchange (IPX) addresses; data logging to store network and error statistics; and a percentage-ranked listing of the top seven protocols.

The hand-held device can be used to isolate and **diagnose network problems,** set filters and decode protocols.

The upgrade kit consists of a floppy disk and cable. Users can run the software on any IBM-compatible personal computer and download the new code to the LANMeter via the cable.

Fluke: (206) 356-5500.

Wandel & Goltermann, Inc. (W&G) last week announced a new release of the Internetworking Diagnostics and Monitoring System (IDMS)-3000 Series Manager net management software for its **Remote Monitoring (RMON)** probes. The software will feature optional support for an Internetwork Delay and Reachability application that measures end-to-end network delay between pairs of local network segments.

The application, which will run on either the IDMS-3015 token-ring RMON probe or IDMS-3013 Ethernet RMON probe, will measure traffic delay across any Internet Protocol- or Internetwork Packet Exchange (IPX)-based internetwork.

The new application, which will be available with Release 3.0 of the Series Manager software in August, costs $2,500.

W&G: (800) 277-7404.

RADCOM Equipment last week rolled out its new portable **Asynchronous Transfer Mode (ATM) protocol analyzer.** The RC-200-C is a Reduced Instruction Set Computing-based device with dual segmentation and reassembly processors. It connects to any notebook or personal computer and is controlled by Windows-based application software.

The analyzer can measure ATM Adaptive Layer 3, 4 and 5 transmission and reception, as well as generate and monitor line traffic and capture ATM cells for analysis. It supports a variety of Line Interface Unit (LIU) cards, including 155M bit/sec fiber, T-1/E-1 and T-3/E-3 coaxial cable as well as 100M bit/sec TAXI fiber. The base unit and one LIU card cost less than $15,000.

The product is available now.

RADCOM: (201) 529-1100.

LAN MANAGEMENT

McAfee to publish open mgmt. API

BY CARYN GILLOOLY

Santa Clara, Calif.

McAfee Associates last week announced LANOpen, a suite of application program interfaces (API) designed to facilitate interoperability between local-area network management applications.

McAfee, based here, also announced ROMShield, an antivirus application written to take advantage of the LANOpen APIs.

ROMShield checks an individual workstation's boot sector for viruses while it is being powered up.

COORDINATING INFO

Today, LAN managers have virtually no way to coordinate the information they get from different LAN management packages as few of these packages work together.

For example, an inventory application may give the administrator information regarding the location of adapter cards on a network.

But that data is gathered and delivered separately from information collected by a trouble-ticketing application about which adapters are causing errors.

By utilizing the LANOpen APIs, developers of LAN management applications could offer customers products that will work together.

Virus detection packages such as ROMShield, for example, could work with other such packages, updating one another on new types of viruses to watch out for.

LAN management vendors will be able to use the APIs in two ways: They will be able to write new LAN management applications to this API set that will work with other compliant applications, while they can also use the APIs to build hardware-based management agents.

These agents, such as ROMShield, would reside on network adapter cards rather than in an application.

According to William Larson, president and chief executive officer of McAfee, the company will bring out an inventory agent within six months, a metering agent within nine months as well as a trouble-ticket registering agent within 12 months.

FASTER PERFORMANCE

With the agents embedded in hardware devices, management tasks will be performed faster than if they were written as software-based applications.

"The DMTF is addressing client-side component technology. This expands [DMTF's] scope to include PC LAN management products, using our R&D and revenue."

William Larson
President and CEO
McAfee Associates

Users said the hardware-based agent approach makes sense.

"I've always thought that this type of information is best left to hardware, not software," said Bret McGinnis, manager of network services at Boole & Babbage, Inc., a San Jose, Calif., software vendor that is using ROMShield.

"Having it in the hardware means it's faster," he added.

Analysts said the APIs — and firmware-based applications — could help solve a real user problem.

"Integrating LAN management tools — that's the crux of the issue for the next three years for LAN administrators," said Bob Johnson, associate director for services research for Dataquest, Inc., a market research firm in San Jose.

"An asset management tool can be as beautiful and robust as can be, but if it can't talk to your help desk management tool, then you're really just on a very nice island," he added.

David Cappuccio, research director at Gartner Group, Inc., a market research company in Stamford, Conn., said LANOpen "could fill a void in LAN management left by [Desktop Management Interface] and SNMP."

See McAfee, *page 20*

SGI makes splash in corporate server pool

BY CARYN GILLOOLY

Mountain View, Calif.

Silicon Graphics, Inc. (SGI) last week added two relatively low-cost systems to its existing server line that are designed for corporate computing environments.

The SGI challenge

Server model	Base price
*Challenge S	$12,250
*Challenge DM	$44,800
Challenge L	$78,800
Challenge XL	$128,800

*New models

All models are available now.

GRAPHIC BY TERRI MITCHELL

These new servers boast powerful I/O systems that make the machines suitable as not just file servers, but also for handling databases, multimedia applications and other bandwidth-intensive programs.

The new Challenge S is a single-processor system starting at $12,250, and the new Challenge DM supports as many as four processors and starts at $44,800.

By comparison, SGI's existing Challenge L and Challenge XL machines start at almost $80,000 and can support up to 36 processors (see graphic).

The Challenge DM supports up to four R4400 100-MHz CPUs, offers 64M bytes of memory and has a 2G-byte disk drive.

The system is based on a 1.2G bit/sec bus and supports multiple 320M bit/sec PowerChannel-2 I/O adapters.

These adapters support multiple HIPPI connections, 24 Small Computer System Interface (SCSI)-II channels, 19 Ethernet ports and 12 Fiber Distributed Data Interface ports.

See SGI, *page 20*

Users invest in remote access technologies

BY SKIP MACASKILL

San Jose, Calif.

If companies want proof that an investment in remote network access pays off, they need look no farther than the recent floods in Georgia or earthquakes in Southern California.

In both cases, users who had remote access to corporate local-area network-based resources were able to get work done despite not being able to physically get to their offices.

Because of these and other types of applications, the market for remote LAN access is poised for rapid growth, according to consultancy Infonetics Research, Inc., here. Infonetics recently completed a user survey on the emerging remote access market, which the firm expects to top $2.23 billion by 1997.

"Besides telecommuters and mobile workers such as couriers and traveling sales staff, companies are linking remote offices back to corporate headquarters at an amazing pace," said Michael Howard, president

See Remote, *page 20*

McAfee

Continued from page 19

"While DMI addresses component-level management is-sues and SNMP addresses enterprisewide issues, neither fully addresses the interoperability requirement of LAN management applications," he explained.

SUPPORT

According to Larson, the firm is working with several adapter card vendors — which he would not name — to embed the LANOpen technology in their products.

"An asset management tool can be as beautiful and robust as can be, but if it can't talk to your help desk management tool, then you're really just on a very nice island," said Bob Johnson.

McAfee will also try to garner support from other LAN management vendors for LANOpen.

To meet this goal, McAfee is trying to have the LANOpen technology included in the DMI specification defined by the Desktop Management Task Force.

SPECIFICATIONS

The DMI is a set of specifications that will allow administrators to uniformly gather information about the hardware pieces of desktop machines such as memory, adapter cards and microprocessors.

But, to date, there is no public specification that allows management systems to work together to gather that information.

Intel Corp. offers such an API within its own product set, but it is not a public specification.

The LANOpen APIs are available for the asking, while ROMShield is available for $69.99.

©McAfee: (408) 988-3832.

Comments?

See "Contacts" box on page 2.

SGI

Continued from page 19

The lower end Challenge S server offers two Ethernet channels, three SCSI channels and two slots into SGI's proprietary bus, which supports additional SCSI, FDDI, Asynchronous Transfer Mode (ATM) and video options.

The Challenge S server is available in two configurations: with a 100-MHz MIPS Technologies, Inc. R4600 processor, a 500M-byte disk drive and 32M bytes of memory; or with a 150-MHz R4400 processor, a 1G-byte disk drive and 32M bytes of memory.

Both systems run the IRIX operating system, SGI's version of Unix System V Release 4.

NEW MARKETS

According to Kevin Gorey, product manager at Silicon Graphics, based here, the new systems are targeted at a different market than the company's existing systems.

While the Challenge DM supports symmetric multiprocessing and can run real-time applications, the company's existing server products are designed to run much higher level, processor-intensive applications.

"We originally started as a graphics company, producing I/O-intensive applications and advanced supercomputers to support those applications. We were never known as a file-serving company," Gorey said.

"We were much more focused on the compute side," he added.

©SGI: (415) 960-1980.

Remote

Continued from page 19

of Infonetics. "There is a strong correlation between the rise of remote access and the installation of LANs in remote branch offices. Companies are willing to pay for access, which is why we've seen so many vendors entering this space."

Madge Networks, Inc., for example, last week rolled out a new token-ring card designed specifically for the remote access market.

Essentially, the company took its top-of-the-line offering and eliminated many of the media options and silicon components that would have been overkill for a small office.

The resulting 16M bit/sec adapter is available for $295 — about half as expensive as the company's high-end card.

Existing vendors in this area have spent most of this year enhancing their remote access products to stay ahead of the newer players.

Shiva Corp., for example, last week rolled out a new version of its Ethernet and token-ring LanRover remote access server that adds support for LAN-to-LAN routing and integrated security levels.

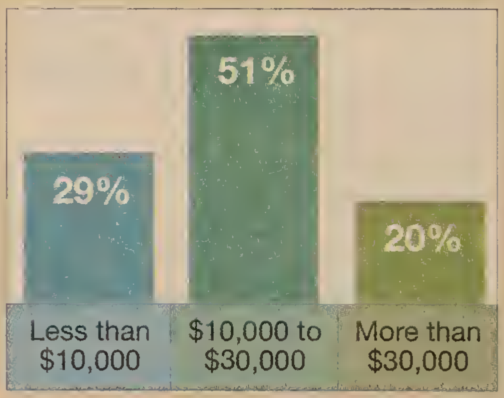
MORE CONSOLIDATION

According to the survey, 89% of the respondents preferred to buy remote access products from vendors with complete network solutions rather than from makers of a single device or line of devices. That bodes well for the large hub and router players entering this market and puts pressure on the small dial-up and remote access server vendors.

"We'll continue to see a lot of consolidation in this market as the bigger players make their pitches for the smaller modem, dial-up and terminal server vendors," said Jordan Stone, senior analyst at Infonetics.

Paying up

How much users are willing to spend on LAN access technology at remote sites.



Based on a survey of 114 users.

SOURCE: INFONETICS RESEARCH, INC., SAN JOSE, CALIF.
GRAPHIC BY TERRI MITCHELL

Providing remote access to corporate resources is primarily driven by the need for companies to provide better service to their customers, according to the survey of 144 users.

"Supporting customers in the area of sales and service and support is a key area for companies that are under ever-increasing competitive pressures," Stone said.

"By giving users access to a variety of business applications housed on the corporate LAN, companies can give remote sites more tools and information," he added.

By enabling some employees to be telecommuters, companies are also keeping their workers happy and productive, Jordan added.

"Of the users we surveyed, 98% of them cited increasing worker productivity or keeping workers happy as the biggest advantage of remote access," he said.

"Employees allowed to work from home are more productive because there are fewer distractions. They are also likely to experience less stress since they can eliminate frustrating, bumper-to-bumper commutes," he added.

EXTENDING THE ENTERPRISE

ther factors users cited for embracing remote access technology included state environmental laws that seek to reduce air pollution levels, temporary illnesses, pregnancies, adequate maturity of enabling technology and availability of economical switched services for long-distance links.

The survey found that 24% and 17% of the respondents, respectively, are planning to use Integrated Services Digital Network Basic Rate Interface and frame relay by 1996 as a lower priced alternative to leased lines.

"Availability of services such as ISDN will make it cost-effective to link remote sites and individuals to corporate LANs and extend the reach of the enterprise outward," Howard explained.

©Infonetics: (408) 298-7999.

NET RESULTS

by Mark Gibbs

IBM puts a nail in OSI's coffin

Well, well, well. Yet another nail in the coffin for OSI and an interesting repositioning for IBM.

You may have read last week's *Network World* article on how IBM is ditching LAN NetView (page 1).

The implications of this are not yet completely clear for the few users who bought the product. But IBM's move speaks volumes of the company's interest in standards.

Let us, for a moment, examine IBM's network management offerings.

At the top end, for want of a better term, is the old favorite NetView. This host-based product has been around for a long time and has become the strategic network management platform for several organizations.

IBM has also taken Hewlett-Packard Co.'s OpenView, a Simple Network Management Protocol-based network management system, and engineered it into NetView/6000 for the RS/6000.

NetView/6000 has been a highly successful product for several reasons.

The first is that it is based on a product with a well-thought-out user interface and underlying functionality.

Second, IBM kept the user interface and extended the functionality.

The third and most important reason is that NetView/6000 is based on SNMP, the Transmission Control Protocol/Internet Protocol management specification.

SNMP is unusual — not technically, but from a marketing perspective. It is arguably the most widely accepted, multivendor-supported, interoperable network management standard around.

PRAGMATIC SOLUTION

In short, SNMP is a pragmatic solution — the type that the networking industry really lacks.

So having moved in a good direction with NetView/6000, IBM then went and produced LAN NetView.

This must have seemed like a good idea at the time to someone who has probably been promoted to an unassailable position by now.

OUT OF CONTROL

While LAN NetView could "hear" some SNMP devices, it couldn't control them. What LAN NetView could do was talk to devices supporting the Open Systems Interconnection Common Management In-formation Protocol (CMIP).

CMIP is a Rube Goldberg production. It's big, complex and costly to implement — just what we don't need in practical networks.

It is not surprising that only a hundred or so companies bought into the LAN NetView vision (or should that be the View?).

But now the Itty Bit Machine Corp. has said enough is enough. IBM's internal politics have caught up to the market realities, and LAN NetView is going to be dumped to make room for NetView for OS/2.

NetView for OS/2 shares a code base with NetView/6000, which means that the new offering uses SNMP.

This is good, as users will reap the benefits of a consistent product line developed and tested over a broad market.

JUMPING TO WINDOWS

If only IBM could get away from OS/2 and jump to Windows NT — then what a position the company could develop.

But I'm afraid hell will freeze over first. And in all of this, CMIP is the loser.

Combine this with all of the other defections from OSI — most notably the government effectively abandoning the Government OSI Profile — and the writing is on the wall. IBM has done something smart here, and users should take heed.

Meanwhile, OSI's coffin may not be nailed down completely, but there's no way it is getting out. R.I.P.

Gibbs is a consultant and writer in Ventura, Calif. He can be reached at (800) 622-1108, Ext. 504, or on the Internet at mgibbs@rain.org.

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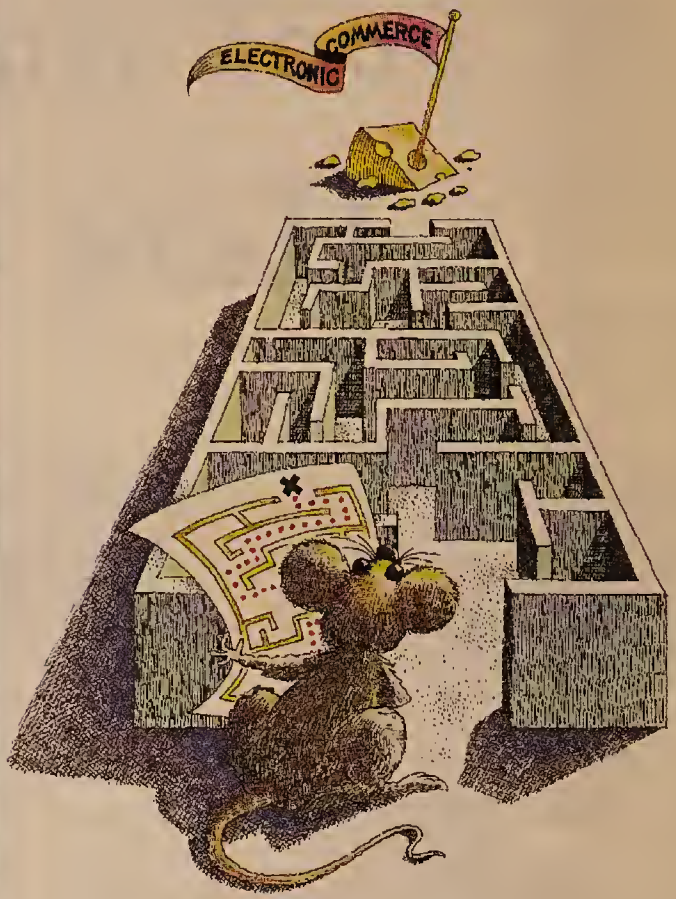

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BRIEFS

AT&T has launched an **800 service** that automates the credit card sales process to reduce labor loads in call centers. The 800 Transaction Advantage service guides callers through voice menus for the collection and processing of order and billing information.

After data is entered by callers — either through a Touch-Tone telephone or verbally via speech recognition software for rotary phone callers — the service accesses a credit card clearinghouse, which validates the purchase, debits the caller's credit card account and credits the business' bank account.

Depending on calling volumes, AT&T customers pay per-call charges of 14 to 48 cents and usage fees of 5 to 11 cents per minute.

AT&T: (800) 858-6342, Ext. 525.

Eunetcom, the joint venture between **Deutsche Bundespost Telekom** and **France Telecom,** opened its network operations center in Frankfurt, Germany, last week, and its first customer, **IBM,** went live with 40 sites throughout Europe. Eunetcom's international backbone has hubs in Belgium, France, Germany, Italy, Spain and the U.S. Sweden, Singapore and possibly Japan will be added this year.

Bell Communications Research said it has received between 1,000 and 2,000 applications for national and regional 555 numbers. Overwhelmed by the response, a Bellcore official said "it will take several weeks, perhaps longer, to sort out what we have."

Bellcore had hoped to start assigning the numbers immediately following the initial application deadline of July 8. The new 555 dialing scheme enables organizations to offer free or paid services — such as facsimile-on-demand — using a single seven-digit number that works across multiple area codes.

Non-AT&T PBX users out in cold with NetWare Telephony Services

Few PBX makers offer compatible drivers as yet.

BY DAVID ROHDE

Charlottesville, Va.

If you want to use Novell, Inc.'s NetWare Telephony Services but do not have an AT&T Definity G3 private branch exchange, you might be out of luck.

While Novell has positioned NetWare Telephony Services as switch-independent, only AT&T, which codeveloped the Telephony Services Application Programming Interface (TSAPI), is now shipping the driver needed to allow users to tie together PBX functions and local-area network data.

Only one other PBX manufacturer — Comdial Corp., based here — appears to be ready to deliver the driver, which enables the client machines to direct telephony functions and automatically access data housed in servers when making or taking a call.

"Comdials and Definitys are the only ones you can buy it for," said Paul Bandrowski, vice president of advanced technology for Upgrade Corp. of America (UCA), a call center service company in Buffalo, N.Y.

Unclear directions from Novell are to blame for the delay at NEC America, Inc.'s customer premises equipment division in Dallas, according to Pete Storrie, director of software development.

Novell is supposed to certify a PBX maker's driver before it is released, and "Novell is making up the certification process as it goes along," Storrie said.

NEC also wants to obtain simultaneous certification for three models covering systems accommodating anywhere from 64 to 25,000 lines, Storrie said, so the benefits are not limited to high-end customers, as is the case with all other participating vendors except Northern Telecom, Inc. (NTI).

Neil Ferris, vice president and general manager for the Advanced Services Division of Novell, confirmed that modifications to the certification process for PBX drivers will be announced later this summer.

Ferris said the PBX makers are taking their time to develop their drivers because they consider reliability paramount and are reluctant to release products that might jeopardize that.

Fujitsu Business Communication Systems confirmed it wants to make sure its NetWare Telephony Services driver is "bulletproof" before it is released.

"A lot of people don't believe that PBX vendors can do this kind of stuff," a Fujitsu spokesman said. "Our engineering department feels it wants to proceed cautiously with this."

Other key PBX makers may be putting more of their computer-telephone integration efforts elsewhere.

While still trying to produce a NetWare driver, Rolm is quietly developing an "information telephone" that will bypass the personal computer and populate an expanded telephone display with caller data, said Peter Pribilla, Rolm president and chief executive officer.

The new telephone would connect to a database and provide a PC-like "intuitive user interface" to allow scrolling through directories and options, Pribilla said.

"We don't need the PC people to do this for us," he said.

Meanwhile, AT&T customers such as UCA — an inbound call center that handles software upgrades and other support programs for a variety of technology companies — are using TSAPI to speed up work.

UCA's Definity uses automatic number identification to recognize what number the caller is dialing from and Dialed Number Indentification Service (DNIS) to recognize which of many available 800 numbers the caller is dialing. Plus, in response to voice prompts, the caller can enter serial, registration or customer numbers.

This data is sent to the NetWare telephony server, which populates the agent's screen with information that enables the agent to start helping the customer immediately, Bandrowski said.

See PBX, *page 25*

Talk is cheap

A raft of PBX vendors have announced support for NetWare Telephony Services, but precious few are ready to ship a driver linking their PBXs to Novell's telephony server.

Company	Announcement date	Availability
AT&T	Jan. 6, 1993	March 22
Comdial Corp.	Oct. 5, 1993	July
Fujitsu Business Communication Systems	Oct. 5, 1993	September
Mitel Corp.	Oct. 5, 1993	October
Alcatel Business Systems	Oct. 5, 1993	Date not set
NEC America, Inc.	March 1	October
Rolm, a Siemens company	March 3	2nd half of 1995
Northern Telecom, Inc.	June 27	1Q 1995

User shuns IXCs for regional frame relay consortium

BY JOANIE WEXLER

Coudersport, Pa.

Nationwide frame relay nets provided by interexchange carriers (IXC) may not be cost-effectively designed for redundancy for companies with highly concentrated pockets of network sites.

So said Hyperion Telecommunications, Inc., which two months ago cut over a frame relay net provided by a newly formed consortium of regional frame relay service providers called UniSPAN.

Hyperion chose regional UniSPAN member EMI Communications Corp. over AT&T and WilTel as the point firm for its nationwide, internal frame relay networking. The company turned to the consortium because its members have higher concentrations of frame relay switches in local areas than the IXCs, which translates into less back-hauling, said Larry Schuller, Hyperion's network control center manager.

Hyperion's frame relay net carries management and surveillance information from alternative access provider nets in eight cities; the company's business is to manage these carriers' networks.

Until May, Hyperion used 56K bit/sec private lines from AT&T to connect eight cities in the East, South and Midwest to its network control center here, but decided it wanted the diversity afforded by the virtual meshing of a public frame relay cloud.

"Because EMI is local, they have more switches in this area [than the IXCs] and could give us dual access" out of the network control center, Schuller explained. The others could not do so affordably because of much longer distances to the nearest switch.

Wholly-owned national networks tend to have a broader but shallower concentration of switches and thus must back-haul links longer distances to high-capacity backbone switches, he explained.

"Long back-hauls also mean more point-to-point access links where we don't get the benefits of frame relay," Schuller added.

Performance-wise, response time using frame relay has improved, Schuller said, though the company has not made exact measurements.

From a service and support standpoint, Schuller said he has a single EMI account team. With his leased-line team at AT&T, "I had to call different people depending on what the issue at hand was. So I'm having a better experience now."

Schuller also commended EMI's coordination with Hyperion's router vendor, Digital Equipment Corp., for configuring the routers for the service.

On the price side, the bids were surprisingly close. Hyperion specified a 64K bit/sec port and two 32K bit/sec permanent virtual circuits in eight cities, plus a 256K bit/sec port in its network control center here.

The monthly bids ranged from $10,162 to $10,406, with EMI at the low end and AT&T at the high end.

Schuller said the net has worked flawlessly so far, and about 50% of it is outside of EMI territory, where he doesn't really know which carrier is providing services. "But it doesn't seem to matter," he added.

The UniSPAN frame relay consortium

Established – May 1994

Goal – Each member carrier provides nationwide connectivity for local customers.

Members:

- EMI Communications Corp., Syracuse, N.Y.
- Insinc, Vancover, British Columbia
- Intermedia Communications of Florida, Inc., Tampa
- MRC, Inc., Brookfield, Wis.
- PacNet, Inc., Seattle
- Southwest Network Services, Inc., Austin, Texas

GTE set for August launch of ATM in Hawaii, N. Carolina

Native Ethernet WAN service to run $400-$700 a month.

BY BILL BURCH

Washington, D.C.

A 45M bit/sec port will cost you a flat rate of $3,000 to $5,000 per month when GTE Corp. launches Asynchronous Transfer Mode (ATM) service in Hawaii and North Carolina in August.

The carrier plans to roll out 45M and 155M bit/sec service in selected metropolitan areas through the fall, with deployment driven by user demand for ATM transport of video and high-speed data, according to John Saxton, GTE's senior product manager for fast-packet services.

"What we're seeing in real life early on is ATM transport as an integrator of existing services," Saxton said.

Once customers have brought their high-speed applications onto the net, GTE hopes to encourage migration of legacy local-area network applications by delivering native Ethernet transport at a flat rate ranging from $400 to $700 per month. That service would accept Ethernet traffic straight from legacy equipment.

GTE goes with flat rate for ATM

Speed (M bit/sec)	Installation fee	Monthly charge
45	$3,000- $6,000	$3,000- $5,000
155	$5,000- $9,000	$4,000- $8,000

Prices vary by location.

GTE had planned to begin a nine-month trial on July 1 in its top market, Los Angeles, but now says that trial will not begin until later this month.

Trials are underway in the Northwest, and the carrier expects to offer commercial service in select cities in Florida, Oregon, Texas and Washington in the fall.

Among other carriers, Bell Atlantic Corp. will this month file an ATM tariff with the Federal Communications Commission (*NW*, June 27, page 1).

GTE is sticking with high-speed ATM for its launches, skipping 1.5M bit/sec service for the time being, although Saxton said he would consider it if demand develops. The top ATM application to date has been video, which can use the service's higher speeds.

The carrier's pricing will vary by city, but all will be flat rate (see graphic).

GTE's rate of $3,000 to $5,000 per month for a 45M bit/sec port seems reasonable, according to Carl Remon, a consultant with Consulting and Contract Services in Jamesville, N.Y. However, "the [Optical Carrier-3] seems a lot more reasonable" at $4,000 to $8,000 per month for a 155M bit/sec port, he said.

GTE may be building its ATM offering around service in the metropolitan area, but Remon is not yet sold on the idea. Users willing to take on the engineering and equipment cost can buy dark fiber for less and get hundreds of times the capacity, he said. In Remon's opinion, ATM services may make more sense in the wide area.

Other users have embraced local ATM. Around Portland, Ore., the experimental Network for Education and Research in Oregon connects a number of universities for research and engineering projects. Applications include distance learning, telemedicine, workstation connectivity, scientific visualization and distributed computing.

Local 155M bit/sec ATM connections from GTE and US WEST, Inc. link Oregon State in Corvallis and the Oregon Center of Advanced Technical Education, the Oregon Graduate Institute, Oregon Health Sciences University and Portland State University, all in Portland. The network also ties in the University of Oregon in Eugene via a 45M bit/sec inter-local access and transport area ATM link from AT&T.

The schools are not paying for local services now, but GTE's flat-rate pricing will be a welcome change from the hefty fees they now pay AT&T for the inter-LATA link, said David Meyer, a senior network engineer at Oregon University. ◼

GTE's ATM rollout schedule

Late July	Nine-month technology test begins in Los Angeles.
August	Commercial service will be offered in Hawaii and North Carolina.
Fourth quarter	Commercial service will be available in communities outside Portland, Ore., and Seattle. Service will begin in Irving, Texas, and Tampa.
May 1995	Commercial service will be offered in Los Angeles.

SITBON; KUBEL-THIOL

RATE & TARIFF MONITOR

by Eric Paulak

Beware of 'free' calls

As 900 numbers have gotten a bad name, phone companies have been ordered to offer free blocking of 900 numbers for residential customers and PBX owners have blocked them through their switches.

As a result, 900 services have become less profitable because fewer people can actually access them.

So along comes pay-per-call services accessed through 800 numbers. They're the perfect scheme. Users have been conditioned for the past 25 years to believe that 800 calls are free. And according to the phone companies, the calls are still free; it's the "service" provided by way of the call that costs the caller.

And, boy, can they cost. Some of the dial-a-porn services run as high as $10 a minute.

As a result of these high costs and the complaints that came with them, the Federal Communications Commission and the Federal Trade Commission enacted new regulations last September to protect users from getting hit with 800 pay-per-call charges.

Currently, the only legal ways to access a pay-per-call service through an 800 number are if you use a credit card, or if the phone is in your name and you presubscribe to the service. If you presubscribe, the cost of the call shows up on your local phone bill.

But no one has set specific requirements for presubscription verification procedures, so it's fairly easy to subscribe even if you aren't the one paying the phone bill, which has fueled some calls from irate parents. But, believe it or not, the phone companies are starting to police themselves.

BellSouth, Bell Atlantic and NYNEX have backed out of acting as the billing agents for 800 pay-per-call services. So if you dial one of these 800 numbers anywhere on the Eastern seaboard, the bill won't show up in your monthly Bell statement.

But just as the Bell companies are starting to crack down on 800 pay-per-call services, Bellcore is opening up a new number for pay-per-call services, and it's just as ingrained as 800 numbers were. The number is the 555 exchange.

The problem with both the 800 and the soon-to-be 555 numbers is that the calls themselves are free, just like the phone companies have said. It is what's being carried by the calls that is costing users. And since the phone companies don't "own" the services, they don't have to file the rates for the services and the services go unregulated.

One possible solution to this would be to regulate the service providers. This could be done directly, similar to how cable TV companies now have to file rates for the different classes of channels they offer.

Or the service providers could be regulated indirectly by requiring the phone companies that carry the services to disclose the service prices or set price caps.

Neither scenario is likely to play out, however. The FCC is inundated with tariffs already. The only answer that remains is to let the buyer — or, in this case, the caller — beware. If you make an 800 call and are greeted with, "Hi, sexy," chances are you're not going to talk for free.

➻ Paulak is associate publisher for the Center for Communications Management Information in Rockville, Md., a provider of rate and tariff information. He can be reached at (301) 816-8950, Ext. 327.

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France Telecom

PBX

Continued from page 23

Because other PBXs do not capture ANI, DNIS and call-prompted information in the same way, Bandrowski said, development of drivers to perform these same "screen pops" in call centers is hampered.

For example, NTI's Meridian PBXs do not have a field to retain call-prompted information such as registration numbers gathered by interactive voice response, Bandrowski said.

Even using the Definity, Telephony Services applications can only retain the ANI, DNIS and call-prompted information for the first agent dealing with the customer.

"When I transfer a call, all three of those pieces of information are wiped out," Bandrowski said. The next release of NetWare Telephony Services, due by the end of the year, is supposed to solve this problem, he added. ☑

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Explosive growth starting to catch up with Sybase

BY BARB COLE

Emeryville, Calif.

Sybase, Inc., which has benefited from the troubles at rivals ASK Group, Inc., Informix Software, Inc. and Oracle Corp. during the past few years, finally seems to be suffering some of its own growing pains.

Analysts said that Sybase, known for its strong marketing and client/server technology, has lost some of its focus. As a result, it has fallen behind schedule on several product shipments and may be failing to meet the needs of users growing their nets.

Industry observers cited these specific issues:

- The company's efforts to expand its product line beyond the SQL Server database into the middleware and development tool markets have yet to pay off and may be causing shipping delays in these and other areas.
- Sybase released a buggy version of its System 10 database last November that took six months to repair. Customers reported performance problems and crashes in its Replication Server component.
- Navigation Server, the System 10 piece that handles parallel processing, has yet to appear. It was originally slated to ship in November of last year.
- Build Momentum, a client/server development tool scheduled to ship at the end of 1993, is just now entering beta tests.

Such production problems are nothing new in the database industry, but they are for Sybase.

"Oracle, [Computer Associates International, Inc.'s] Ingres, and Informix have had their bad periods," said Curt Monash, editor and publisher of the "Monash Softwa-

See **Sybase**, *page 30*

Where Sybase stands

What's right:

- Stellar marketing has made company's name almost synonymous with client/server.
- Has solid customer satisfaction ratings.
- Has strong financials.

What's wrong:

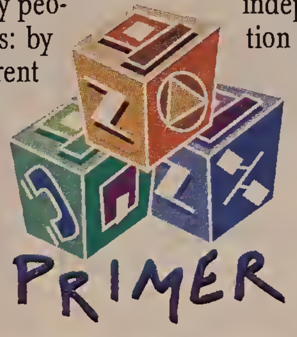
- Is late shipping its Build Momentum and Navigation Server.
- Parallel processing support lags behind that of rivals Oracle and Informix.
- SQL Server System 10 bugs took about six months to fix.

OpenDoc: a new way to integrate apps

BY KEVIN FOGARTY

If backers of a new object-oriented application development scheme get their way, vendors and users will soon be creating applications the way people used to build monster stereo systems: by picking the best components from different sources and plugging them together.

IBM, WordPerfect Corp. (now called Novell Applications Group) and Apple Computer, Inc. think the plug-and-play concept has not been taken far enough in software development. The three, plus minority partners Xsoft (a Xerox Corp. division) and Taligent, Inc., have joined forces to develop OpenDoc, an object-creation and linking protocol.



OpenDoc's creators envision a world in which independent software vendors create application components, such as word processing, spell-checking and text layout functions, and let users buy only the pieces they want.

For example, users might combine the basic word processing and spell-checking components from WordPerfect, but use a graphics or text design component

See **OpenDoc**, *page 31*

BRIEFS

CE Software, Inc. of West Des Moines, Iowa, last week announced a new **electronic mail** offering called QM-Postman that lets QuickMail users and administrators set up and manage group distribution and mailing lists. End users can set up lists of up to 250 names; administrators up to 15,000 names. Mailings can be scheduled for off-peak hours to avoid bringing down network performance. The product is available starting at $99 per server.

CE Software: (800) 523-7638.

First Floor, Inc. of Mountain View, Calif., today will announce its entry into the **groupware** market with a file- and information-sharing application. The company's Network Central for Windows lets users set up shared folders across a net, as well as create their own folders containing files from both their local machine and net servers. Users are notified of any changes in files when they open a folder. The software supports both the Messaging Application Programming Interface and the Vendor Independent Messaging application program interface.

Introductory pricing starts at $99.95 per license.

First Floor: (800) 639-6387.

The **Spectra Logic** division of Western Automation Laboratories, Inc. announced a **backup system** for **Informix Software, Inc.'s** On-Line database. Alexandria Backup Librarian lets administrators back up and restore live Informix databases and integrates database backups with Unix file system backups, the company said.

Alexandria can work with tape libraries from Advanced Digital Information Corp., Exabyte Corp. and Spectra Logic, and to Hewlett-Packard Co.'s Optical Jukeboxes. It runs on a variety of Unix servers and clients. The system, available now, will cost $6,000 to $9,000, depending on host system size.

Spectra Logic: (303) 449-7759.

STANDARDS UPDATE

E-mail vendors are just mad about MIBs

BY ADAM GAFFIN

Leading electronic mail vendors are flocking to back an Internet standard for managing E-mail routers via SNMP, with some promising to deliver products based on the specification within the next 12 months.

Vendors such as Lotus Development Corp. and Novell, Inc. said the Mail and Directory Management (MADMAN) Management Information Base (MIB) offers a possible first step in taming increasingly complex enterprise E-mail networks. The MIB, designed to work with various vendors' Simple Network Management Protocol-based management platforms, was developed by the Internet Engineering Task Force (*NW*, April 18, page 4).

Novell expects to ship a MADMAN-based set of management tools either with NetWare 4.1, due in the fourth quarter or shortly after, said Philip Schacter, product marketing manager for NetWare messaging. Novell demonstrated a prototype monitoring system based on MADMAN in April.

"We think it's a great idea," said Ed Owens, director of technical relations for Lotus Development Corp.'s cc:Mail. Lotus has already committed to SNMP support in its Lotus Communications Server for Notes and cc:Mail, due in the first half of 1995.

MICROSOFT'S STANCE

Microsoft Corp. took a more cautious approach last week. Thom McCann, program manager for the company's Microsoft Exchange messaging project, stopped short of saying Microsoft would support MADMAN in its products. But he did say that the company is continuing to evaluate MADMAN and other potential messaging management strategies.

"There are certainly things in [the MADMAN specifications] that make sense," McCann said, adding that Microsoft will work with the Electronic Messaging Association (EMA) and others to develop industry standards.

"We set out to get all the key vendors, and we did," said David Knight, chairman of the Messaging Management Council, which led the charge to support the MIB. Knight is also vice president for marketing at Los Angeles-based X.400 software vendor Isocor.

At a meeting in Chicago this week, the council will hand over the job of developing commercial specifications for the MIB to the EMA's Messaging Management Committee.

The move to EMA will help reduce the reluctance of some vendors, such as Lotus and Novell, to participate in a group they perceive to be controlled by Microsoft. The Messaging Management Council was formed in April by Microsoft and Isocor.

Knight said he also hopes to involve vendors of network management consoles, on whose products the E-mail monitors will likely run.

In its current form, a MADMAN console would periodically poll message transfer agents (MTA) to determine such information as the number and total size of messages queued in an MTA and the age of the oldest message. This data could then be used to trigger alarms if one of the values got too high.

Diary of a MADMAN MIB

What it can tell a net administrator:	What proposed extensions might allow:
• Whether a message transfer agent (MTA) is working	• Tracking of specific messages
• How many messages are queued up in the MTA	• Showing the average time a message is in a queue
• The age of the oldest message	• Message store management

GRAPHIC BY TERRI MITCHELL

Owens said one of MADMAN's weaknesses is that it provides no way to track individual messages. He would like to see that issue addressed and would also like to see a way to monitor average throughput at an MTA.

An SNMP-based system would prove welcome relief to Rick Fell, network analyst for Chevron Information Technology Co. in San Ramon, Calif.

"I'm all for the ability to manage my mail network from a single console," Fell said.

Chevron now uses E-mail probes from Baranoff Software Co. of Brighton, Mass., and SoftSwitch, Inc. of Wayne, Pa., to test messaging router performance across the firm's national E-mail net. However, the probes only test the routes between the console that launched them and the MTA — not the routes between MTAs themselves. Given that the company now has nearly 100 MTAs, checking these routes can be a time-consuming process, he said.

In the long run, Fell said, he would want to see MADMAN expanded to not only diagnose, but correct problems.

Gupta casts development tool line, hoping customers will bite

BY BARB COLE

Menlo Park, Calif.

Gupta Corp. last week announced several marketing and pricing moves involving its development tools that are designed to attract developers who have yet to move to client/server.

Gupta said it will give away 50,000 copies of a new low-end version of its Windows-based client/server development tool, an effort to get SQLWindows in the hands of many more corporate developers.

Eventually, Gupta hopes to entice these developers into buying more full-featured versions of SQLWindows that include connectivity to multiple databases and can be deployed across the enterprise.

The firm also announced plans to offer new Starter and Network Editions of its SQLWindows development tool and a 12% price reduction on its high-end version of SQLWindows.

SQLWindows Solo is a single-user version of SQLWindows 5.0, featuring a 5M-byte version of Gupta's SQLBase database engine. SQLWindows Solo will be available free to the first 50,000 people who order it, and will cost $99 thereafter.

The firm also announced an SQLWindows Starter Edition for developing client/server-based applications. The $995 package includes expanded object libraries and integration with Lotus Development Corp. Notes.

SQLWindows 5.0 Network Edition offers all of the functionality available in the Starter Edition, but can also access non-Gupta databases, such as those from Oracle Corp., Informix Software, Inc., Microsoft Corp. and Sybase, Inc. It sells for $1,995.

> **"With SQLWindows Solo, we are changing the rules for desktop software. It will become a sampler for networked versions."**
>
> -Umang Gupta
> President, CEO
> Gupta Corp.

Meanwhile, Gupta trimmed the price of its SQLWindows 5.0 Corporate Edition software from $3,395 to $2,995. This software includes team programming facilities, a series of application program interfaces for integration with computer-aided software engineering programs and a compiler.

The moves reflect how competitive the client/server development tool market has become. Gupta rival Powersoft Corp. entered the low-end client/server development tool market in February with PowerBuilder Desktop, priced at $249.

Analysts said Gupta's introduction of a "lite" version of SQLWindows was necessary for the company to stay competitive with Powersoft and Microsoft.

"Right now, the tools market is very competitive. That's because most client/server development is taking place at the departmental level where people don't expect to pay as much for software," said Wayne Kernochan, director of commercial systems research at Aberdeen Group, Inc. in Boston.

©Gupta: (415) 321-9500.

Brainstorming session

Brainstorm Technologies, Inc. last week said it has sold a tool to Gupta Corp. for integrating Lotus Notes with back-end databases.

The product, SQL/Link, will be built into Gupta's SQLWindows 5.0 client/server application development software.

Brainstorm said it is building objects that will let SQLWindows users create applications that can call up information stored in Notes databases. These objects will be shipped with SQLWindows starting in September, Brainstorm said.

Separately, Brainstorm today will announce Version 2.0 of its VB/Link tool kit for building Notes applications within such applications as Microsoft Corp.'s Visual Basic. Enhancements include support for Notes rich text, hierarchical document views and embedding objects.

The product is due in the third quarter, starting at $795 per copy.

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BY ADAM GAFFIN

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Bill Jones, MIS, age 38

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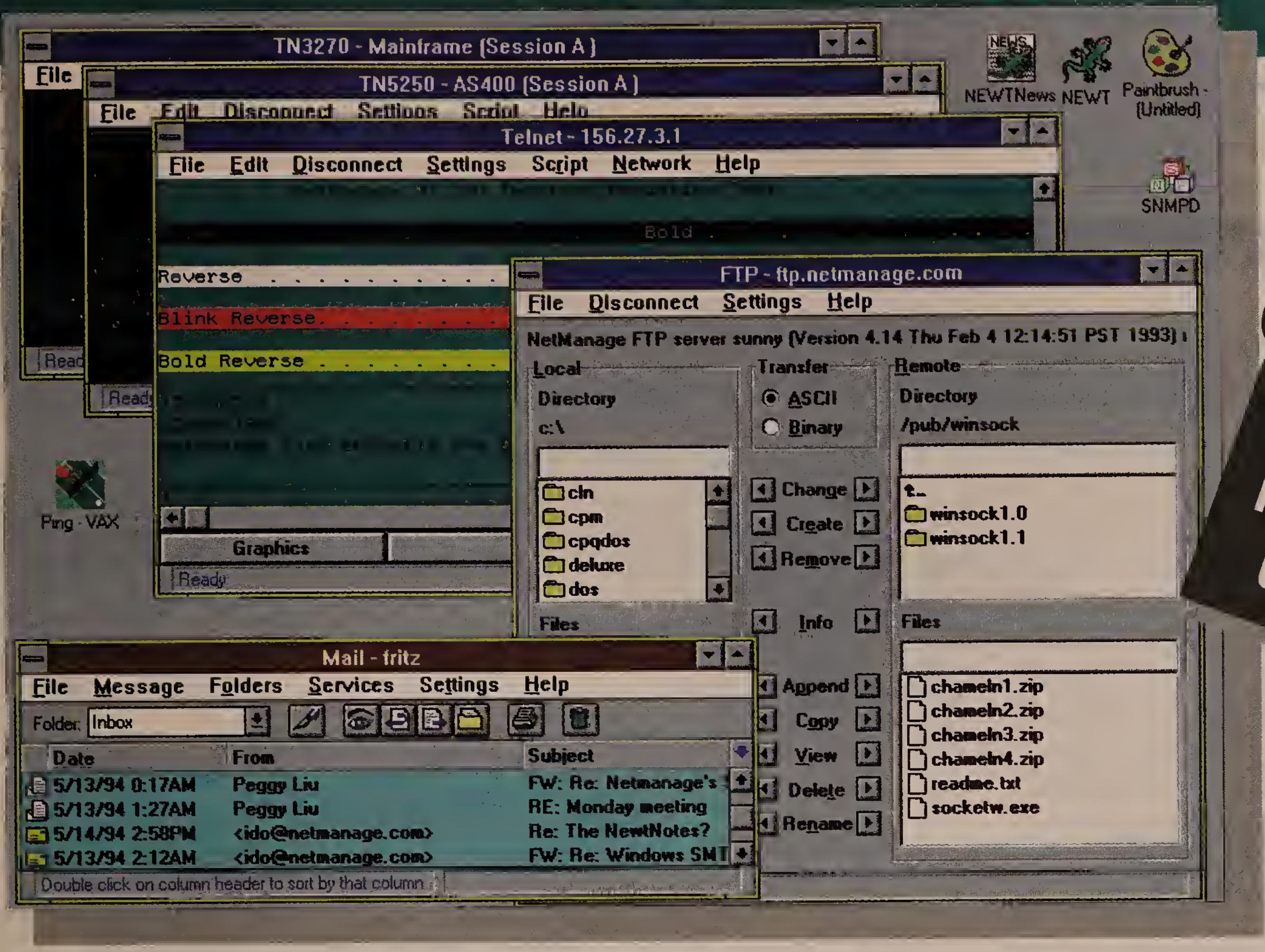
TN3270 - Mainframe (Session A)
TN5250 - AS400 (Session A)
Telnet - 156.27.3.1
File Edit Disconnect Settings Script Network Help
Reverse
Blink Reverse
Bold Reverse
Bold
Graphics
Ready
FTP - ftp.netmanage.com
File Disconnect Settings Help
NetManage FTP server sunny (Version 4.14 Thu Feb 4 12:14:51 PST 1993)
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Files
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ASCII
Binary
Change
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Append
Copy
View
Delete
Rename
Remote
Directory
/pub/winsock
winsock1.0
winsock1.1
Files
chameln1.zip
chameln2.zip
chameln3.zip
chameln4.zip
readme.txt
socketw.exe
Mail - fritz
File Message Folders Services Settings Help
Folder: Inbox
Date
From
Subject
5/13/94 0:17AM Peggy Liu FW: Re: Netmanage's
5/13/94 1:27AM Peggy Liu RE: Monday meeting
5/14/94 2:58PM <ido@netmanage.com> Re: The NewtNotes?
5/13/94 2:12AM <ido@netmanage.com> FW: Re: Windows SMT
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FOLLOW-UP

Vendors release 2 APIs in an effort to ease document access

BY ADAM GAFFIN

Cambridge, Mass.

As expected, a group of document management vendors last week released an application program interface (API) for tying Windows clients to back-end document management systems (DMS).

Once the API is implemented in applications such as word processing programs, as well as in DMSs, companies will better be able to let their end users exchange a variety of document types with one another.

Managing document terms

DEN: Novell-Xerox software for managing documents over NetWare.

ODMA: An API for connecting clients to document management systems.

Shamrock Coalition: User and vendor group developing server-based APIs for enterprise document management.

The Open Document Management Architecture (ODMA) API initially will support 16-bit Windows applications, but it will be available for 32-bit applications by fall, said Keith Clarke, senior product manager for Novell, Inc.'s GroupWare Division.

Vendors backing the API include Adobe Systems, Inc., Documentum, Inc., Electronic Book Technologies, Inc., Interleaf, Inc., Novell, Oracle Corp., Spicer America Corp., Verity, Inc. and Watermark Software, Inc.

Clarke said Novell will support the API in the next major release of its GroupWise application suite, formerly known as WordPerfect Office, due by fall (*NW*, July 11, page 4).

The API was released at a meeting at Lotus Development Corp.'s headquarters here.

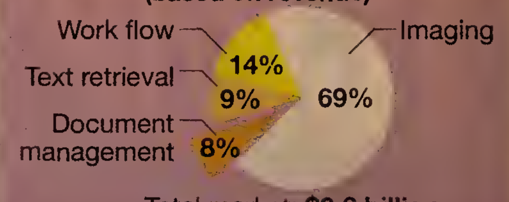
Also last week, at a separate meeting close by in Wellesley, Mass., Novell and Xerox Corp.'s XSoft subsidiary released a draft API for Document-Enabled NetWare (DEN). The API is for building enterprise DMSs for NetWare environments, although the firms said they will attempt to port it to other nets, as well.

The API is expected to be finalized in the first half of next year.

There are plans for both ODMA and DEN to be integrated eventually with yet another API — this being developed by the Shamrock Document Management Coalition, a group of users and vendors working on specifications for linking document management servers.

Where document mgmt. fits in

1993 workgroup application market (based on revenue)



Total market: **$3.6 billion**

SOURCE: DELPHI CONSULTING GROUP, INC., BOSTON

Sybase

Continued from page 27

Letter" in New York. "Now it appears Sybase is about to take its turn on the hot seat."

In addition to knocking Sybase for its late product deliveries, analysts have criticized the System 10 engine design as being difficult for users to manage. Sybase's approach is to offer separate servers for key database functions.

Sybase's leading rivals tend to offer turnkey systems. A recent report by Gartner Group, Inc., a Stamford, Conn., market research firm, said that Sybase's database engine has problems scaling to more than four processors. It suggested that this problem is likely to persist until Sybase rewrites its database engine.

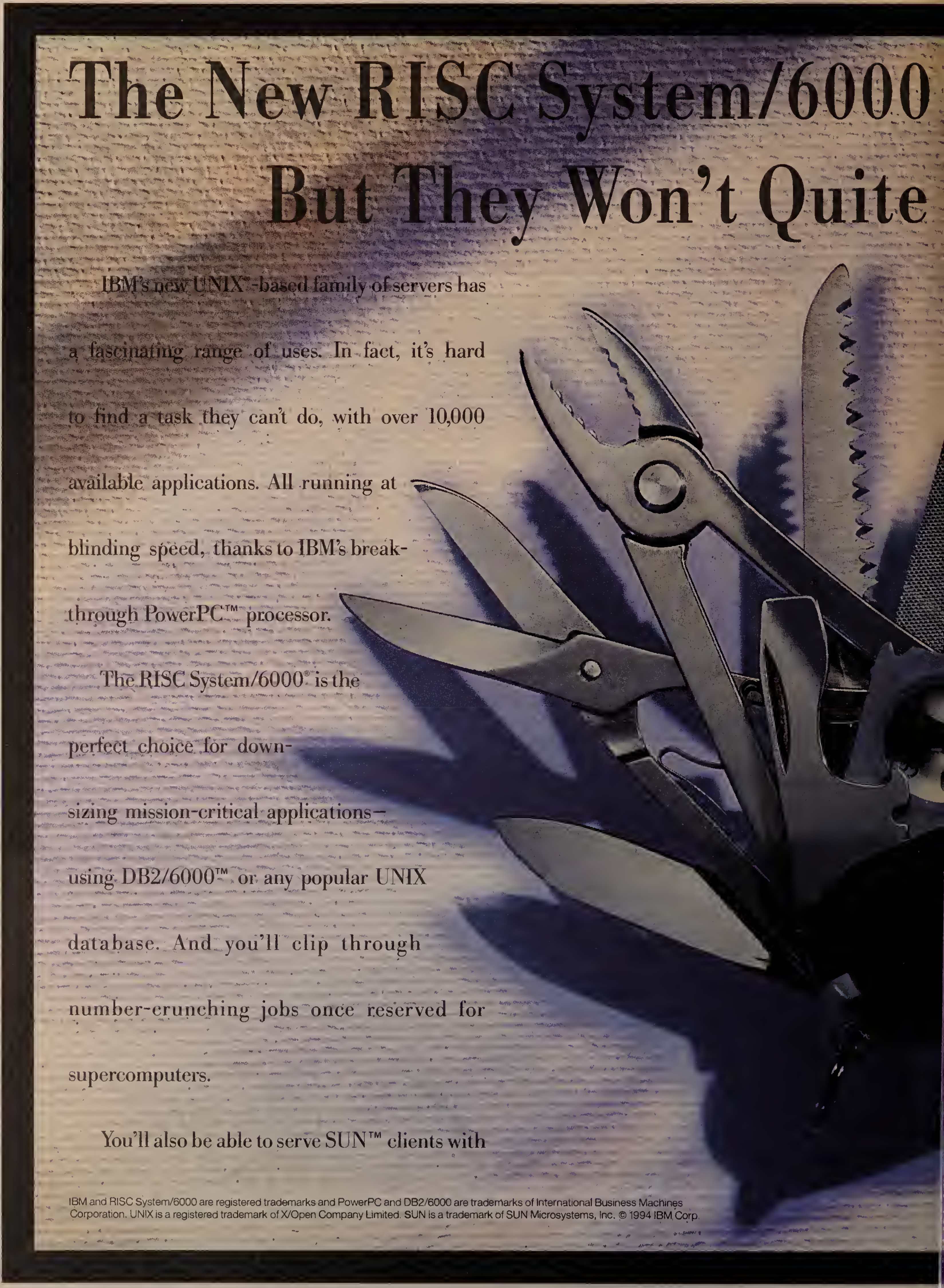
Sybase officials acknowledged the company's mistakes regarding the late products. For example, they cited the complexity of Navigation Server and the company's relative inexperience designing graphical front-end tools.

The company denied, however, that a rewrite of the server is in order. Instead, it promised that the next release of its server will address the scalability issues.

"Our next release will contain a number of extensions to support symmetric multiprocessing," said James Pickrel, director of market analysis at Sybase.

Users, meanwhile, seem to be standing by Sybase. "I have migrated to System 10, and I'm happy with it," said Susan Smith, local-area network and database administrator for the city of Houston. "The absence of parallel processing is not a problem for me today."

"We're disappointed that they haven't been able to get Build [Momentum] out faster, but if it comes out good, then it's worth it," said John Barton, senior database specialist at Software Systems Development Corp. in Phoenix.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CA and ICL pact to stir up groupware market

BY KEVIN FOGARTY

Islandia, N.Y.

Computer Associates International, Inc. (CA) will add a little heat to the U.S. market for groupware following a marketing agreement with London-based computer vendor ICL.

Under the agreement, CA will resell ICL's Unix-based TeamOffice groupware product. ICL, meanwhile, will resell CA's Ingres database and work to integrate CA's UniCenter systems management technology with its own systems management products.

The agreement gives CA for the first time a multifaceted groupware product with which to compete with Lotus Development Corp.'s Notes and the host of next-generation groupware products from Novell, Inc., Microsoft Corp. and Lotus.

TeamOffice runs on OS/2, Windows NT and Unix servers, and supports Windows, DOS and OS/2 clients. It includes an X.400-based electronic mail engine, a bulletin board facility for information sharing, a work flow module, a group and resource scheduling module, and a document management capability.

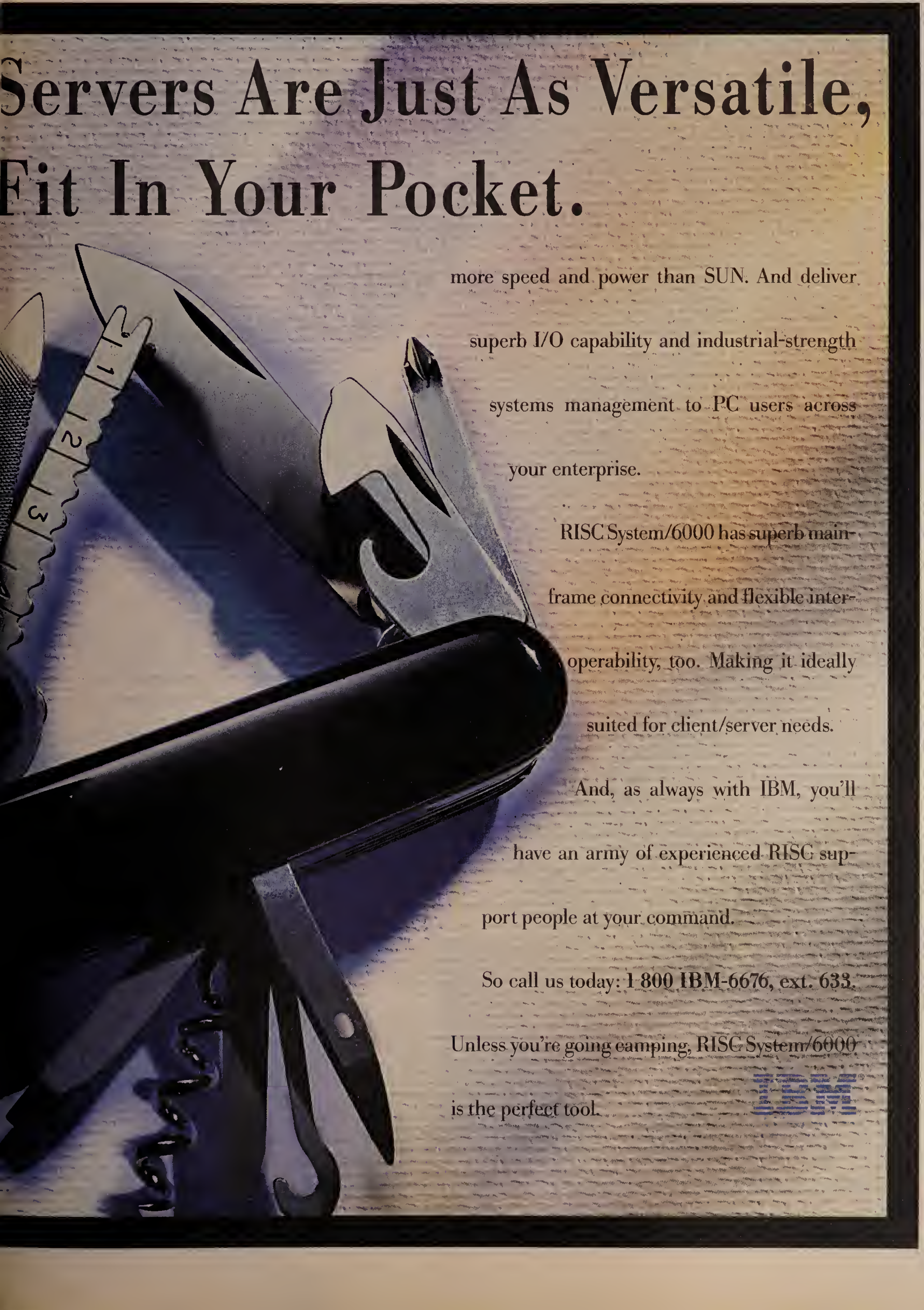
TeamOffice is popular in Europe and Asia, where ICL is strong, but has suffered in the U.S. due to ICL's weak presence here, said Ed Black, a senior consultant with the Aberdeen Group, Inc. in Boston.

If CA integrates TeamOffice with its client/server and desktop applications to create a robust group computing product set, the company could score big with traditional IBM shops experimenting with collaborative computing, Black said.

A powerful groupware product would be a major addition to CA's portfolio, but the company probably will not make much headway if it tries to sell TeamOffice as a stand-alone offering, Black said.

"I don't think people will run away from Notes in a big hurry," he said.

Under the agreement, ICL also pledged to continue porting CA's Ingres database to its proprietary operating systems and servers, including its massively parallel processing Goldrush server. This effort began before CA announced plans to acquire The Ask Group, Inc., which owns the Ingres products (*NW*, May 23, page 10).



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IBM

OpenDoc

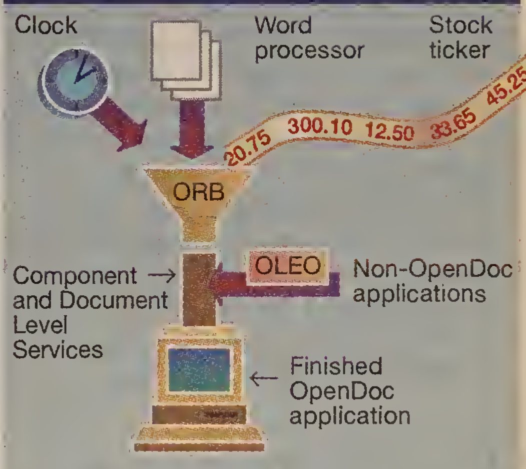
Continued from page 27

from another vendor.

The vendors released Alpha versions of OpenDoc to developers at PC Expo in June, but few vendors aside from WordPerfect, Borland International, Inc. and Symantec Corp. are ready to commit publicly to OpenDoc.

Final versions of OpenDoc should be released late this year, with the first OpenDoc applications probably coming in 1995, said Jed Harris, executive director of Component Integration Laboratories. This company has been sponsored by OpenDoc's backers to develop, promote and distribute the technology.

Putting OpenDoc to work



OpenDoc will enable developers to put application objects into a compound document and run them simultaneously. OpenDoc-based applications can also work with non-OpenDoc applications via APIs.

GRAPHIC BY SUSAN J. CHAMPENY

Users will only have to buy OpenDoc to build applications internally, Harris said. It will be built into off-the-shelf applications.

Unlike potential rival object technology Object Linking and Embedding (OLE), OpenDoc is designed to let applications display several live objects at a time. A user could see a clock and a stock ticker embedded in a document, both showing current data, Harris said. It also will let users overlay objects, and change their shapes, which OLE does not, he said.

OpenDoc applications can even work with OLE through OpenDoc's OLE Objects, which takes advantage of OLE application program interfaces. In OpenDoc, application components talk to each other through IBM's System Object Model (SOM)/Distributed SOM object request broker.

Riding on top of SOM/DSOM are the Bento object store, and libraries that define how objects share resources and can be displayed.

EDITORIAL

Learning from the states

While the federal government struggles to drag the machinery of regulation out of the way of progress, states are making increasingly rapid strides toward real competition for network services.

The big noise about the Information Superhighway is being made down in Washington, D.C., but the feds aren't doing a great job of unleashing the market forces needed to build the thing. Case in point: A major FCC initiative on local loop competition — the collocation order — was recently overturned by an appeals court, becoming yet another in a long skein of rulings bounced back to the agency.

Congress has gotten further than ever in its annual, hot air-driven push to reform telecommunications, but it's still not clear whether the legislative branch will finalize something this year. Contrast that with the state of Wisconsin, which recently put through a sweeping telecommunications reform package that promises to kick up competition, drive down prices and actually get new services out to customers in a timely fashion.

''Wisconsin's Information Superhighway law removes the Bedrockian regulatory system that has stymied the growth of technology in this country as well as its accessibility to consumers. The bill replaces a regulation-driven industry with a market-driven one, which can only mean good news for consumers,'' Wisconsin Governor Tommy Thompson was quoted.

Thompson is forgiven for his obligatory I-way hype and Flintstones reference because he actually got the reform job done. Passage of the legislation puts Wisconsin in the reform elite along with states like Illinois, Maryland, Michigan, Minnesota, Montana, Nebraska, New York and Oregon, which offer pretty close to full local loop competition.

About half the states today offer some form of local loop competition, and all but one — take a bow, Utah — allow competition for intra-LATA toll traffic. A group of about 10 states allows for presubscription to an alternative carrier, which means users don't have to dial a 10-XXX code before making an intra-LATA toll call. Maryland is even pushing for local phone number portability.

Now, the news isn't all good. Some 14 states actually bar local loop competition. And this state-by-state approach to regulation creates a crazy-quilt pattern of competition that's troublesome for users with nationwide nets. What's more, federal reform could spawn conflicts and raise states' rights challenges.

Problems aside, the progress is encouraging. More and more states are viewing regulatory reform as a pro-business initiative, plain and simple. All that high-minded talk about on-ramps to the Info Superhighway, wiring up the schools and taking the world into the 21st century is fine. But the smart ones have realized that competition encourages innovation, jobs, new business opportunities and, most important, new tax revenues.

Why the feds can't seem to get that lesson is unclear.

JOHN GALLANT jgallant@world.std.com

TELETOONS

FRANK AND TROISE

It's really simple... to make data incomprehensible to outsiders, we use cryptography. To make it incomprehensible to everyone we send it to Legal for a rewrite.
ENCODING DEPT.
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Phil Frank

INSIDE INTERNETS

by Mary Petrosky

Wellfleet/SynOptics deal opens up some intriguing possiblities

The merger of Wellfleet Communications, Inc. and SynOptics Communications, Inc. is indicative of two key trends in the industry: the move toward switching technologies and the maturation of the internetworking market. These trends are leading to a consolidation of the players in this market, with both positive and negative consequences for users.

There is now a set of billion-dollar vendors trying to execute similar strategies — helping customers transition from today's routed internetworks to internetworks built around switching.

The new internetworks must combine shared-access hubs, LAN-based packet switching and Asynchronous Transfer Mode (ATM) cell switching — all in a manageable way. Several vendors — 3Com Corp., Cisco Systems, Inc. and Wellfleet/SynOptics — also may become end-to-end internetworking system providers.

As the industry moves to embrace switching, there are a few core technologies that internetworking vendors must have to survive. One is switching, and SynOptics has already invested $50 million in that technology. The other core technology involves interconnecting today's shared-access LANs with the new switching equipment. For that, vendors need to develop a type of hybrid switch and router — something SynOptics couldn't easily do without Wellfleet. And Wellfeet was at risk of becoming a niche player as switching sales inevitably erode router sales.

However, the two companies have a lot of work ahead to integrate their product lines and create a cohesive, manageable whole. For the next two years, the key vendors in the internetworking systems market — 3Com, Cisco and Wellfleet/SynOptics — will be working to flesh out their strategies and product lines. Each has its strengths and weaknesses, so no one vendor is likely to dominate in the immediate future.

These vendors will help customers begin building manageable switched internetworks based on an end-to-end architecture. 3Com and Cisco have already begun defining these architectures — Cisco has its CiscoFusion architecture, while 3Com has its High-Performance Scalable Networking architecture. Wellfleet/SynOptics will need to work quickly to define a similar architecture.

In addition, the market consolidation will help many organizations simplify the purchase, service and support of their networks. Many large companies have reduced the number of vendors they work with to a select few to ease the management of the vendor relationships. With the emergence of end-to-end internetworking vendors, customers will be able to get consolidated sales, service and support.

Similarly, the market consolidation will lead to better integration of technologies and products. Such integration is crucial in light of the challenges customers face in combining shared-access, packet-switched LANs and ATM. Although many ATM specs are in the works, it will be two to three years before truly interoperable products are available. In the meantime, vendors will offer proprietary implementations of functions like LAN emulation, switch-to-switch routing and congestion control.

Many customers will turn to the internetworking systems players for assurances of interoperability and end-to-end management. Ideally, the systems players should provide management functions beyond simply managing all the net components from one management console.

For example, 3Com's Windows-based workgroup management application, Transcend, manages 3Com hubs and adapters so that net managers can get information about hub ports as well as configuration data about the personal computers on the network. The management application can also correlate adapter information to indicate congestion levels on hub ports. Vendors of end-to-end internetworking systems are in the best position to provide this type of cooperative management activity between net components.

On the down side, customers need to carefully evaluate the strategies and product implementations of the leading vendors to determine whether value-added features and end-to-end management come at the price of being locked into that vendor's way of doing things. Both Cisco and 3Com, for example, are working to develop a split-router technology, where the routing logic (or path determination) function of the router is separated from the packet-forwarding component.

In Cisco's case, the company is planning to implement the packet-forwarding function in its workgroup switches while the routing logic can be running on another device. Cisco is defining a messaging protocol to enable the two parts of the router to communicate. This protocol will be proprietary; consequently, for the split-router to work, customers will have to buy their workgroup switches from Cisco, too. Cisco officials say they will work to make the messaging protocol a standard, but that process will undoubtedly take one to two years after the split-router design is implemented. SynOptics and Wellfleet officials have committed to open standards-based products, and we can hope they stand by their word.

Similarly, customers have to weigh the trade-offs between working closely with one or two key vendors to get manageable, well-integrated products and shopping among multiple vendors for the best of each class of product. It's unrealistic to expect one vendor to be able to deploy best-of-breed products across its product line.

We will continue to see consolidation in this market, most likely via acquisitions rather than mergers. Cisco, for example, lacks key pieces — including workgroup and backbone switching technologies — that it needs to be an end-to-end switched internetworking provider. Fortunately for Cisco, it has a considerable amount of money in the bank.

In this evolving internetworking market, all customers should press their vendors for specifics about their strategies and implementation plans. To avoid reinventing the equivalent of an IBM SNA or Digital Equipment Corp. DECnet network, customers need to make it clear to vendors how much — or little — openness they are willing to compromise for the sake of integration and management.

Petrosky is an analyst with The Burton Group, a Salt Lake City consulting and information services firm specializing in technology analysis. She can be reached at (415) 572-0560 or via MCI Mail at 599-3956.

EVENT MONITOR

by John Morency

An economical approach to net management

Thus far, 1994 has been the year for major announcements concerning distributed network management. Vendors such as Hewlett-Packard Co., SunConnect, NetLabs, Inc., Tivoli Systems, Inc. and Cabletron Systems, Inc. have announced their intention to deliver distributed net management platforms in late 1994 and early 1995.

While it is true that distributed management services are required for efficient device polling and statistical gathering, it is also true that network management distribution can be technically achieved through alternative and less costly approaches. These alternative approaches may provide more effective service delivery in the short term than their more complex and costly kindred.

In general, the entry list price for a reasonably equipped Unix-based Enterprise Network Management System (ENMS) ranges from approximately $15,000 to $25,000.

If you have more than one of these ENMSs within your organization, the cost implications of distributed network management quickly become quite significant. And remember, this is only for a very minimal level of network management services. For any system supporting a meaningful combination of configuration, fault, performance and accounting management, the price tag will likely increase due to the need for additional layered management software at each distributed location.

Is there a better short-term approach to economically delivering quality service at more reasonable prices? I think so.

Today, a number of very small, cost-effective local-area network segment monitors are offered by several vendors, including Concord Communications, Inc., Frontier Software and Network General Corp./ProTools, Inc. These products offer configuration, fault and performance management features, primarily for shared Ethernet and token-ring networks. Some vendors, such as Frontier Software, also support Fiber Distributed Data Interface networks.

Many of these segment monitors range in price from $1,500 to $3,000 for both client and server software — considerably less than most ENMSs. They support extensive LAN protocol tracing and analysis through use of the industry standard Remote Monitoring (RMON) Management Information Base, provide remote LAN proxy polling and support distributed triggers through the Simple Network Management Protocol to alert a network manager when one or more threshold conditions occur.

In addition, some segment monitors support wide-area network circuit monitoring, a necessary feature for effectively debugging remote routing problems. Others provide alert threshold and protocol tracing features for all seven layers of the protocol stack, while some even offer packet accounting features, which are essential for charging back internetwork usage.

Segment monitors are generally complemented by client software that provides a Motif graphical user interface and operates in either stand-alone mode in a Unix environment or atop a mainstream ENMS such as HP's OpenView, SunConnect's SunNet Manager or IBM's NetView/6000. Thus, a network manager has a great degree of flexibility in adapting these tools to existing network management platforms.

LAN segment monitors deliver a number of the services that network managers need to increase crucial service levels without requiring excessive Unix system baggage. Given that LAN-based problems can often account for as much as 60% or more of monthly network problem reports, a centralized ENMS coupled with LAN segment monitors on particularly troublesome LANs can deliver much of the benefit today of a fully distributed ENMS at a fraction of the cost.

LAN monitors do have a few drawbacks, however. First, RMON implementations are often incompatible because vendors use specialized value-added RMON variables and features to differentiate their products. Therefore, don't expect a LAN monitor client from Vendor X to easily interwork with a LAN segment monitor from Vendor Y, at least not for a while.

Also, don't expect LAN probes to exist in their current form two or three years from now. At that time, use of both switched LAN and Asynchronous Transfer Mode (ATM) services will likely dictate the use of embedded RMON services directly within a switched hub or local-area ATM switch. (This form of RMON support already exists within the recently announced Cabletron Multi Media Access Center (MMAC)-Plus and SynOptics Communications, Inc. LattisSystem 5000 hubs.)

However, if you are a beleaguered network manager with a very minimal capital budget and are faced with the problem of optimizing today's network service quality, LAN segment monitor products may be just the solution for you.

➾ Morency is a principal with Strategic Networks Consulting, Inc., a Rockland, Mass.-based firm that specializes in internetworking. He can be reached at (617) 871-5195 or via MCI Mail at jmorency.

SECURITY PERSPECTIVES

by Michael Kabay

Copyrights don't vanish in cyberspace

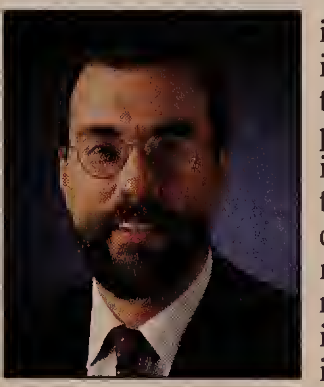
Cyberspace is a new frontier, and as such, the rules governing it are still in flux. However, just because information is in electronic form and doesn't cost anything to download doesn't mean that copyrights, common sense and common civility should disappear.

Some electronic mail users are making up their own rules about ownership of the E-mail they receive. I encountered one such user last year when I posted a column I had written (the copyright for which is owned by *Network World*) on the Internet's comp.risks forum. The column reads:

"The following text is Copyright (c) 1993 by Network World. All rights reserved. Permission is granted by the copyright holder and the author to distribute this file electronically or otherwise as long as the entire file is printed without modification (other than cosmetic or formatting changes)."

An Internet user replied:

"I beg to differ. I received this material unsolicited. I therefore consider it to be mine to dispose of as I wish."



Mystified, I replied:

"Are you a subscriber to comp.risks by mistake? Is that what you mean when you say you received my column 'unsolicited?' Because if subscribing to a distribution channel doesn't constitute asking for the material, and if not asking for material voids the copyright, then *Time* magazine, *Network World* and lots of other publications are going to be in real trouble if you ever subscribe to them."

My correspondent sent me the following reply:

"...comp.risks is not a publication, it is a communications channel. With publications, there is an implicit contract to respect copyright. A communications channel has no such implicit contract. It is the same as the post office. Any material received by post unsolicited becomes the property of the recipient. This applies to E-mail and posts. It does not apply to mailing lists or news groups that have specific distribution contracts attached (for example, clarinet). At least, this is what my legal philosophy says."

I responded as follows:

"Thank you very much for your interesting views on copyright law.... Out of curiosity, I must ask whether your attitude to copyright extends to found objects. For example, if you were to stumble across a copy of a magazine, would you feel justified in printing large sections of it in, say, a textbook? If someone hands you, unsolicited, a legitimate master disk for Lotus 1-2-3, do you think that you can legally make copies for others because they didn't ask for the disk?

"In any case, thanks for the opportunity to dispense with the

See Kabay, *page 44*

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SWITCHED DIGITAL SERVICES

DOCUMENT MANAGEMENT SYSTEMS

Buyer's guide

A tall order for document managers

Dearth of products that can do it all makes selection process difficult

By LINDA MUSTHALER

As corporations begin to wake up to the fact that information stored in documents strewn across the enterprise represents a treasured corporate asset, selecting a document management system (DMS) becomes more strategic.

Indeed, many firms no longer consider DMSs a luxury. On the contrary: A DMS that can create, store, search, retrieve, edit and distribute documents is becoming a necessity.

The only problem is that few DMSs come close to being able to do it all. Instead, most products excel in only one or two functional areas, such as text management, imaging support or document distribution.

A well-rounded DMS will support several core functions. Chief among these functions is an indexing and search capability that makes it possible to track documents stored across the enterprise and quickly locate them when they are needed. A library management capability tracks how many versions of a document exist, and who is using them at any time is also critical.

Likewise, a DMS needs a document assembly capability in order to pull together individual text, image and graphic files into a finished document. Finally, a document distribution feature is needed to direct the flow of documents throughout an organization using in-place networks.

Acquiring a DMS that provides those core functions may require the help of a systems integrator who can take multiple vendors' offerings and fuse them together in order to exploit the individual strengths of each one.

In fact, Memphis, Tenn.-based Federal Express Corp. expects it will need systems integration help to get the DMS it wants. FedEx has issued a request for proposal for a DMS capable of tracking images of engineering drawings as well as text, and supporting distribution via work flow. The system must also be based on off-the-shelf products that will run in an open systems, client/server environment.

"I expect that all the bidders will be able to satisfy the imaging requirements easily," says Wayne Richmond, FedEx's project engineer. "The distinguishing factor will be how they handle the document management." And for that reason, Richmond says FedEx is willing to turn to an integrator to tie a strong imaging product together with a strong DMS.

Vendors too will get into the integration game. For instance, DMSs provided by Interleaf, Inc. and the Xerox Corp.-owned Documentum, Inc. are highly customizable and both firms offer integration services.

Vendor alliances are also springing up to tackle this integration issue. For instance, SoftSolutions Technology Corp. integrated Watermark Software, Inc.'s document imaging technology into a special edition of its DMS called SoftSolutions with Imaging. PC Docs, Inc. has also built Watermark's technology into its PC Docs Open product.

With built-in document imaging capabilities, a DMS can manage scanned-in images of documents. Users can then retrieve and view these images but cannot edit them. For instance, health insurance claims are often stored as document images. Once scanned into a DMS, the claims can be stored, viewed and possibly printed. Users can annotate the images with text or sound, and attach other files or documents to the images, but they can't change the image itself.

Systems that perform only document imaging are considered a subset of the DMS market because they only manage images. Full-fledged DMSs manage documents consisting of editable text, images, sound or video. For example, a DMS can be used to manage an automotive repair manual that consists of text, graphics and pictures and is updated frequently as repair procedures change. The original source for some information in the manual may come from a scanned document image. In such a case, the DMS can use optical character recognition (OCR) software to transform the image into text or some other editable form of data such as a bit-mapped graphic, which can then be managed by the DMS.

THE MARKET

If documents are a firm's primary product, as in the publishing or architectural fields, the focus should be on examining high-end DMSs such as those provided by Interleaf and Documentum. Both firms' products offer the highest level of functionality, including strict document library-like check-in/check-out capabilities, version control, archiving, distribution, viewing and document assembly. With such functionality, both firms offer true enterprise DMSs that are capable of managing documents across many different server and client platforms.

High-end DMSs enable users to create complex documents with information stored in separate files. The DMS tracks these source files, and updates all related documents when one piece of information changes. For instance, a DMS used to track instruction manuals will reflect a part-number change made in a master parts file in all the manuals that reference that particular part. High-end products also maintain early versions of documents for historical purposes and route or distribute documents.

Interleaf sells its DMS in a series of modules, with Relational Document Manager (RDM) being a core module. RDM provides document indexing and searching capabilities. But RDM can be bundled with other modules that provide work flow management, a secure repository for storing documents, a document distribution system and a component for document composition and assembly. The bundled package of modules is called Intellecte. Interleaf has built a unique 12-week implementation process around Intellecte that includes just-in-time training and consulting services.

The bulk of DMSs fall into the mid-range of the market. Included in this segment are IBM's Visual Document Library, PC Docs' PC Docs Open, Verity, Inc.'s Topic, the Xsoft division of Xerox's Visual Recall, Salix Systems' DocStor, and Excalibur Technologies Corp.'s Excalibur Electronic Filing System (EFS).

Mid-range products offer some very high-level features for text management, primarily in search-and-retrieval functional-

Continued on page 36

NETWORK WORLD
SHORT LIST
1 9 9 4

Document management systems

✓ **Documentum, Inc.**
Documentum Enterprise Document Management

✓ **Excalibur Technologies Corp.**
Excalibur Electronic Filing System

✓ **SoftSolutions Technology Corp.**
SoftSolutions 4.0

Honorable mention:

✓ **Interleaf, Inc.**
Relational Document Manager

Complete details about The Short List appear on page 37.

inside

- **Standards setters map out document management's future. Page 36.**
- **Top 10 list of must-have capabilities. Page 36.**
- **Buyer's Guide chart helps you search and retrieve DMS data. Page 37.**
- **Software's Big Three sing different document management tunes. Page 40.**
- **Readers lay out their document management plans. Page 42.**

Continued from page 35

ity. However, mid-range products lack the extensive document creation, assembly and distribution capabilities found in high-end products. Nevertheless, mid-range products are well suited for managing text files across multiple servers in the enterprise or in a smaller workgroup setting.

Mid-range DMSs are helpful for firms that have groups of authors contributing to the construction or use of such documents as contracts or proposals. Because documents are checked in and out of the DMS in library style, administrators can always tell who is working with the document at any given time.

Finally, DMSs at the low end of the market tend to provide minimal capabilities, concentrating mostly on basic document search and retrieval. Low-end DMSs — such as AskSam Systems' AskSam and AskSam for Windows, and Odyssey Development, Inc.'s ISYS — offer text search-and-retrieval capabilities for documents created using third-party applications and stored on a server or a networked workstation's hard disk.

With limited document assembly, library and distribution functions, low-end DMSs are suited for workgroups that need occasional access to documents.

PRODUCT ARCHITECTURE

Products in each market segment have one thing in common: They share a client/server architecture that consists of four main elements.

The heart of a DMS is a core application that runs on a server. Client code running on networked workstations provides a user interface into the core application.

The third element is an indexing and search engine that typically resides on a file or database server. The engine works with a database that keeps track of where documents are stored and permits users to search for documents. Lastly, there are the documents themselves. Documents can be considered objects that consist of a variety of file types — such as text, image, audio and video — that are stored virtually anywhere, from individual hard disks to multiple servers across the enterprise.

DMSs that enable users to search for documents no matter where they are stored are true enterprise products. Workgroup-oriented DMSs will limit users to searching for text only on the local workgroup server.

In general, low-end products fit the workgroup mold. High-end products give users the option of creating a central document repository or document server that can be accessed by any client.

On average, 40% to 60% of an employee's time is spent working with documents, according to Xerox Corp. Some people spend 150 to 200 hours a year just searching for the information needed to do their jobs.

Currently, there is a tight link between the client and server components of a DMS, which forces users to acquire both from the same vendor.

However, that is changing. DMS vendors are creating or adopting established open architecture standards that will enable users to mix and match DMS products from various vendors in order to get just the right combination of features and capabilities (see story, this page).

For the most part, today's DMSs are separated from the third-party applications used to create and edit documents such as Microsoft Corp.'s Word or WordPerfect Corp.'s WordPerfect.

This separation is important because it enables customers to use whatever products they prefer to create documents.

When document files are created, they are handed off to the DMS in any variety of common formats for indexing. All the DMSs listed in the chart on page 37 support common file formats, such as ASCII, Revisable Form Text (RFT) and Document Content Architecture (DCA), and commercial formats, such as Word and WordPerfect. Many DMSs also support multimedia file formats, such as the Tagged Image File Format (TIFF) and the Joint Photographic Expert Group (JPEG) format.

In addition to working with third-party document creation tools, some DMSs offer integral creation capabilities to satisfy custom requirements.

FINDING A BURRIED TREASURE

A key area of differentiation in product architectures lies in how the DMS has implemented its indexing and search feature. Indexing tracks where documents or parts of documents are stored.

Searching enables users to locate documents that meet specific search criteria by examining data in the index files in-stead of the actual documents themselves. How a DMS employs indexes affects the speed and quality of document searches.

The indexing and search engine of a DMS is a highly specialized function. Only a few companies have developed unique technology for these engines — Excalibur Technologies and Verity among them. Other DMS vendors license this unique technology and embed it into their products.

One common form of indexing is to create a nonrelational inverted matrix data file — also called a full-text index — that lists all the significant words in every document under management. Insignificant words — also known as stop words — such as "the," "that" and "of" are not recorded in the index. Typically, the DMS has a list of default stop words, but the list is customizable by the system administrator (see graphic, page 40).

An inverted matrix is similar to a book index in which words are side-by-side with the page numbers on which they can be found. Significant words in an inverted matrix index are coupled with pointers that reference the documents in which they can be found. This approach enables users to search the full text of all documents by browsing the inverted matrix index file. The pointer information informs the

The DMS top 10 features

1. A library-like check-in and check-out system.
2. A way to number versions of documents.
3. A full text search-and-retrieval feature that permits searches by key words, synonyms or words appearing in proximity to other words.
4. A configuration manager that creates relationships between document components, such as sections that comprise a chapter.
5. A file manager for accessing documents, regardless of where they are stored.
6. The ability to manage images the same way text and other objects are managed.
7. The ability to access and manage information from databases.
8. The ability to search and manage documents by key components, such as table of contents or section headings.
9. Multilevel security that restricts document access to specific users or can set limited privileges such as read-only or add-only.
10. Administrative and management functions for accounting and archival.

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.

Industry-shaping standards

Several existing and emerging standards are playing a key role in shaping the document management system (DMS) industry. Different vendor groups have developed or are working on standards for everything from product interoperability to document format. Vendor commitment to implement these standards will be a factor in product selection today and tomorrow. Here's a look at some of the most important standards.

Enterprise Document Management (EDM)

The Shamrock Document Management Coalition is defining EDM as a framework for providing interoperability among different vendors' DMSs running on different platforms. Further, users will be able to tap one vendor's front-end DMS tool to access and use documents stored in other vendors' back-end DMSs.

Shamrock, an association of computer manufacturers, application and operating system developers, and major end users, began meeting in March 1993 and continues working today.

EDM addresses how vendors can build standard document creation, library management and document distribution services into the back-end components of their DMSs. EDM will also define open application programming interfaces (API) that will enable developers to incorporate document enterprise library services (ELS), document communication methods and document generation into critical client/server business applications. The intent of these APIs is to enable applications to easily access server-based document management services.

The group's first deliverable, released in draft form earlier this year, is a specification for ELS, an interactive set of middleware services that provide a way for various clients to access document repositories on different document management servers. Thus, one vendor's front-end DMS tool can access other vendors' back-end document index databases.

Because the EDM specifications are still in their infancy, fully compliant products are many months or years away from general availability. If present Shamrock initiatives bear fruit, documents will be managed seamlessly across disparate DMSs.

Open Document Management Architecture (ODMA)

While the Shamrock group is developing specifications for interoperability among DMSs, ODMA members are developing a set of APIs that will open up the interface to applications running on clients.

The ODMA group has developed a standard dynamic link library interface to integrate end-user applications with DMSs. This API, released in June, simplifies the development task for vendors of desktop applications and document management software by eliminating the need to support multiple client interfaces.

Standard Generalized Markup Language (SGML)

SGML is a standard for document description published by the International Organization for Standardization in 1986. The rationale behind SGML is to make documents interchangeable so information creation, management, retrieval, printing and display functions can be performed using the hardware and software best suited for each task.

Since it provides a vendor-neutral, formal, international standard for information interchange, SGML is being widely adopted for sharing document-based information in open systems environments. Adobe Systems, Inc., Aldus Corp., Lotus Development Corp., Microsoft Corp. and WordPerfect Corp. are either delivering or promising to deliver SGML support in their products.

SGML breaks a document down into three components: data, structure and format. The standard recognizes that a document's content is separate from its style. Also, SGML stresses that document formatting should be optimized to user requirements at the time of delivery. Thus, information about how to display text and graphics is imbedded into the document at the time of creation so that another system picking up the document will be able to read the information and know how to display it.

A document in SGML format can be routed to many different computer systems because it becomes independent of the application that created it. A single document can be processed in many ways: formatted for printing, saved to a database, displayed on-line or combined with other media for mixed-media displays.

Many software vendors are implementing the standard to let users choose best-of-breed tools to create, manage or retrieve documents and the data in documents. For example, a document could be created in Aldus PageMaker and displayed, with all formatting intact, on a workstation running Microsoft Word. The user would not need to worry about file conversions and document formatting; the embedded SGML code would take care of those concerns.

Partial list of Shamrock Document Management Coalition members:

- Adobe Systems, Inc.
- Aetna Life and Casualty Co.
- Andersen Consulting
- The Coca-Cola Co.
- EDS Corp.
- Frame Technology Corp.
- HP
- IBM
- Interleaf, Inc.
- Merck & Company, Inc.
- Microsoft
- Saros Corp.
- Sybase
- ViewStar Corp.
- Wang Laboratories, Inc.

Partial list of Open Document Management group members:

- Adobe
- Andersen Consulting
- Autodesk, Inc.
- Documentum, Inc.
- Interleaf
- Microsoft
- Novell
- Oracle
- PC Docs, Inc.

Document management systems

Company	Product	Architecture level	Hosts	Clients	Network environments							Document standard	Annotation	Index overhead	File management	Free support	Pricing
		E = Enterprise W = Workgroup	N = NLM OS = OS/2 U = Unix V = VMS W = Windows WN = Windows NT O = Other	D = DOS M = Macintosh U = Unix W = Windows WN = Windows NT O = Other	VINES	DECnet	LAN Server	LAN Manager	Windows NT Advanced Server	NetWare	TCP/IP	O = OpenDoc S = SGML	S = Sound T = Text	Percent of document size	A = Automatic archiving D = Automatic deletion M = Multiple versions S = Schedule processes	Months	C = Client M = Multiple user/ No. of users S = Server U = Per user
AskSam Systems (800) 800-1997	AskSam	W	O	D	✓		✓	✓		✓				10		Unlimited	U: $395 M: $200/1; $1,095/5
	AskSam for Windows	W	W, WN	W, WN	✓		✓	✓		✓			S, T	NA		Unlimited	U: $395 M: $200/1; $1,095/5
Documentum, Inc. (510) 463-6800	Documentum Enterprise Document Management	E	U	M, U, W							✓	O, S	S, T	50	A, D, M, S		U: $700-$1,500
Excalibur Technologies Corp. (619) 625-7900	Excalibur Electronic Filing System	E	U, V	M, W, O		✓		✓			✓			33		3	U: $12,000 M: $51,000/10; $81,000/20
IBM (817) 962-3698	Visual Document Library	E	OS	O			✓			✓				70	A, D, M, S	2	S: $300-$360 U: $300 (1)
Interleaf, Inc. (800) 955-5323	Relational Document Manager	E	U, V, O	M, U, W		✓					✓	S	T	1	A, M, S		M: $40,000/16; $375/150+
Lotus Development Corp. (800) 346-1305	Lotus Notes	E	N, OS, U, O	M, U, W, O	✓	✓	✓	✓		✓	✓		S, T	15-40	A, D, M, S	1	C: $495 M: $4,950/9 S: $495 U: $495
Mobius Management Systems, Inc. (914) 632-7960	Document Direct	E, W	OS, WN, O	D, U, W, WN, O	✓	✓	✓	✓	✓	✓	✓	O, S	T	2.5	A, D, M, S	12	M: $1,499/ Unlimited S: $40,000+
Odyssey Development, Inc. (800) 992-4797	ISYS	E	W, WN, O	D, W, WN	✓		✓	✓	✓	✓	✓	S	S, T	20-25		Unlimited	M: $1,550/5; $13,215/50 U: $395
PC Docs, Inc. (904) 942-3627	PC Docs Open	E	N, OS, U, V, WN	W, WN	✓			✓	✓	✓	✓		S, T	3-5	A, D, M, S	Unlimited	C: $299 S: $495
Salix Systems (800) 725-4948	DocStor	W	U, O	U							✓		T	20-60	A, M	1	M: $35,312/25 (2) U: $1,350
SoftSolutions Technology Corp. (801) 226-6000	SoftSolutions 4.0	E	N, U, O	D, W	✓	✓	✓	✓		✓	✓		S, T	2-5	A, D, M, S	Unlimited (3)	C: $295 M: $1,495/5 S: $495 U: $295
Verity, Inc. (415) 960-7600	Topic, Topic Real-Time	E	OS, U, V, O	D, M, U, W		✓	✓			✓	✓			50	D, S		S: $15,000 U: $495
Wang Laboratories, Inc. (800) 639-9264	Open/Profound	W	U, O	W	✓					✓				NA	A, D, M, S		C: $295 S: $795-$2,495
XSoft, a division of Xerox Corp. (800) 428-2995	Visual Recall	E	W	W						✓			S, T	20	M	3	U: $395

Products highlighted by color were selected for The Short List.

Chart compiled by Cheri Paquet

FOOTNOTES:
(1) Volume discounts are available.
(2) Includes server and clients.
(3) During business hours.

NA = Not applicable
NLM = NetWare Loadable Module
SGML = Standard Generalized Markup Language

DMS of which documents to retrieve to complete the search.

As a result of listing each significant word in all documents, inverted matrix indexes can be quite large and chew up a significant amount of storage space. They can often require more than 50% of the space needed to store the documents themselves.

But oddly, the growth of an inverted matrix index slows down as the number of documents increase. This is because as more documents are stored, the chances that significant words already exist in the matrix gets higher. In such a case, the DMS need only insert pointers to the new documents.

Verity takes the inverted matrix index a step further by letting users create relationships between documents in its Topic product. The indexing scheme in Topic lets users create relationships among certain words maintained in the index file. For instance, users can define any documents containing the words "scuba diving," "football," "baseball" and "bicycling" to be associated with the term "sports." Every time a user searches the index for "sports," Topic will retrieve all the documents containing the words associated with it. Several vendors, like Documentum, have embedded

Continued on page 40

NETWORK WORLD SHORT LIST 1994

Document mgmt. systems

The Short List highlights products Network World *recommends you examine during the purchasing process for document management systems (DMS). Products included on this Short List provide many important document management functions, such as cataloging diverse documents in a library system, extensive capabilities for indexing and searching on specified parameters, and assisting with the assembly and distribution of documents. Products on the list meet the needs of users with multivendor enterprise nets. Your criteria may differ.*

■ Documentum, Inc.
Documentum Enterprise Document Management

Documentum offers one of the most comprehensive DMSs on the market today. It is clearly a product that can meet the needs of a large enterprise, but it also functions well in a workgroup scenario. When ordering the product for small workgroups, users can request that the company disable unnecessary functionality in exchange for a lower price. Yet, the product remains highly scalable so it can grow as the user's needs increase.

Documentum has taken the lead in treating documents and their components as objects. So cataloging, storing and searching different data types are not a challenge. Documentum uses index and search technology from Verity, Inc. and Excalibur, which offer some of the strongest index and search technology available today.

Documentum's product is noted for advanced features such as transaction processing, automatic document format transformation, document archiving and full work flow capabilities. Strong security features keep users from circumventing the DMS to manipulate documents by using operating system commands such as Copy and Delete.

■ Excalibur Technologies Corp.
Excalibur Electronic Filing System

Excalibur has some of the most exciting search-and-retrieval technology in the document management market, making its product a good solution for managing all kinds of data, not just text. The technology lets users conduct so-called fuzzy searches, which locate information that comes close to matching what is specified in the search criteria.

Excalibur also has embedded optical character recognition technology in its product to easily translate scanned images into text. The product runs on Unix- or Digital Equipment Corp. VMS-based hosts. Excalibur is evaluating a port of its product to run in a Novell, Inc. NetWare environment. The product supports Windows, Apple Computer, Inc. Macintosh and NeXT Computer, Inc. clients.

■ SoftSolutions Technology Corp.
SoftSolutions 4.0

While it does not provide everything a user needs for document management, SoftSolutions 4.0 is a strong solution. The product supports multiple servers and a distributed document architecture for DOS and Windows clients. Also, SoftSolutions 4.0 offers a portable mode to support mobile users, strong security features and document viewers that support more than 100 different file formats. Perhaps the most appealing aspect of SoftSolutions 4.0 is that as a division of WordPerfect Corp., which was recently purchased by Novell, the small development house should now have the financial and technical resources to make a good product even better.

Honorable mention:
■ Interleaf, Inc.
Relational Document Manager (RDM)

Purchased stand-alone, RDM provides a robust set of indexing and search capabilities for users in the publishing industry but has limited appeal to users in other fields. The product can also be bundled with several other software modules to form Intellecte, a well-rounded document creation and management product for publishers.

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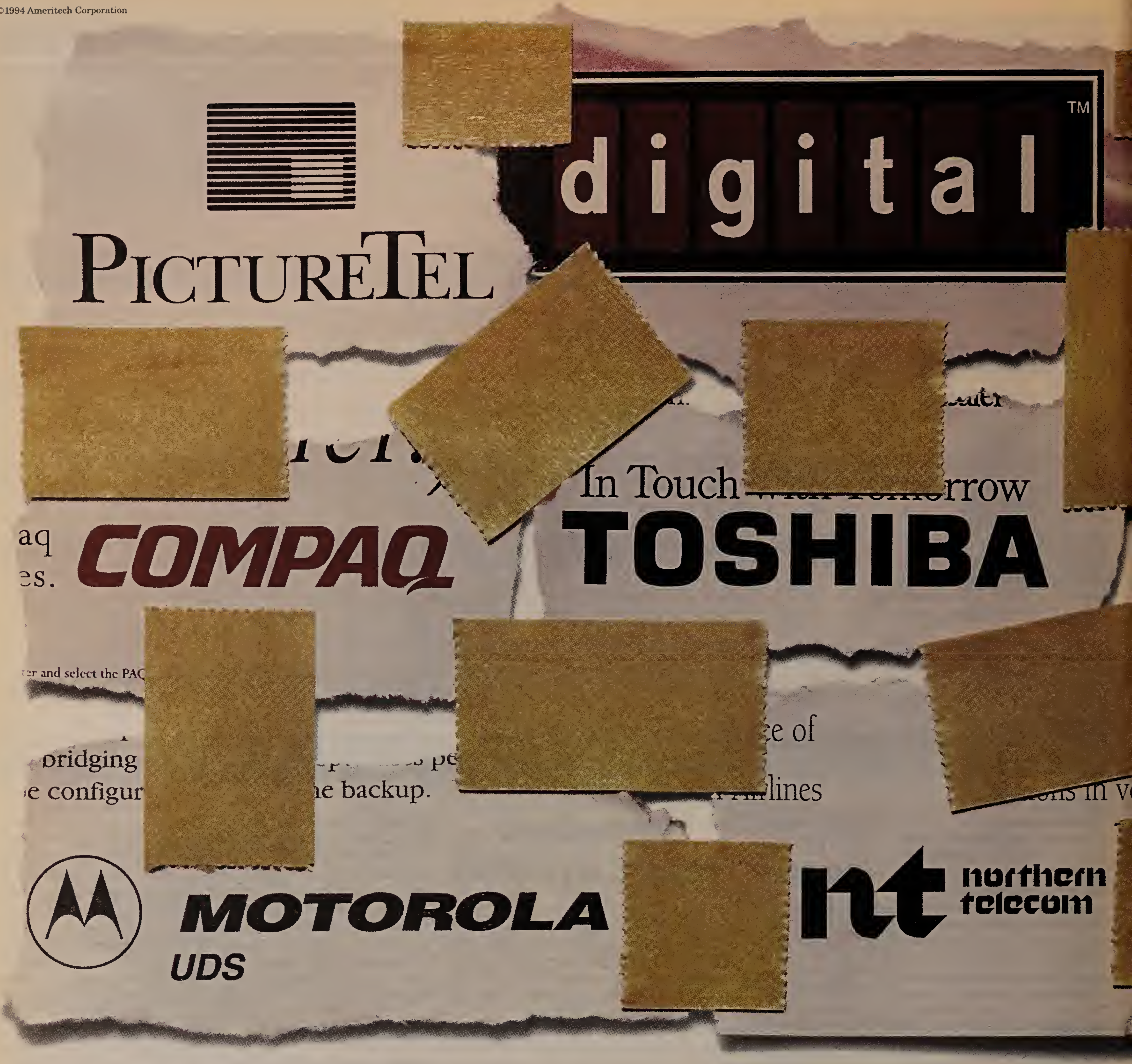

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Continued from page 37

Verity's technology in their products.

Excalibur Technologies also offers a unique full-text index in its Excalibur EFS product. Called Adaptive Pattern Recognition (APR), this indexing method supports text and non-text objects, such as scanned-in document images, audio and video.

For instance, APR converts documents scanned into a DMS using OCR to distinctive bit patterns instead of words. The same holds true for text, sound and video. APR then builds pointers to documents that contain the same or very similar bit patterns, an approach that permits users to conduct so-called fuzzy searches that turn up any document that contains a bit pattern that is similar to the one requested in the search.

On the surface, it seems APR would return too many near-miss documents, but that is not totally true. Users can fine tune the desired precision that is required to make a match.

Lockheed Advanced Development Co. (LADC) in Palmdale, Calif., uses Excalibur EFS to manage documents about hazardous materials. LADC is pleased with how Excalibur EFS indexes and searches over 26,000 documents in the firm's library of text files and images, says Ralph Evans, systems manager.

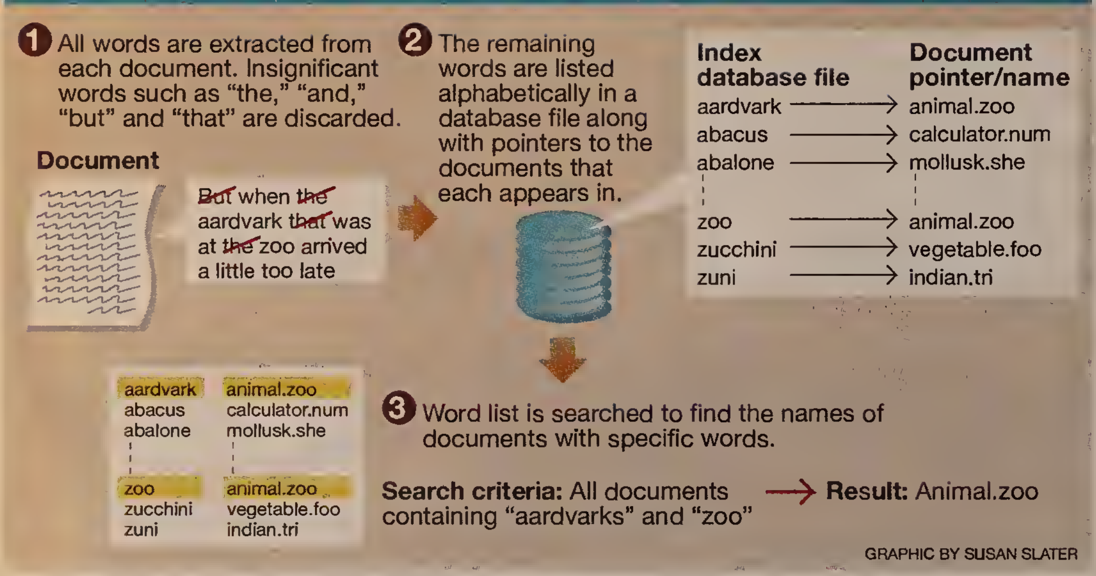
"The search capabilities are fabulous," Evans says. "We can search our documents in multiple ways. We can even search for text in an OCR document. And we can view the documents immediately after the search."

Evans says the fuzzy search capability is handy when information about frequently misspelled hazardous materials is needed quickly.

To illustrate his point, Evans says he searched for documents that contained the word "dizzi." Within 12 seconds, Excalibur EFS responded that 1,987 of the company's 26,000 documents contained something close to that word, including the properly spelled "dizzy."

LADC has been so pleased with the fuzzy search capabilities that it has built a fax-back system that utilizes Excalibur EFS. Anyone across the country needing information on hazardous materials can use a push-button phone to request information about a particular material. Within about a minute, the appropriate document will be located and on its way to the requestor's fax machine. The fuzzy search capability enables callers to get away with misspelling a compound's complex name but still receive potentially lifesaving information quickly.

Indexing documents: inverted matrix index

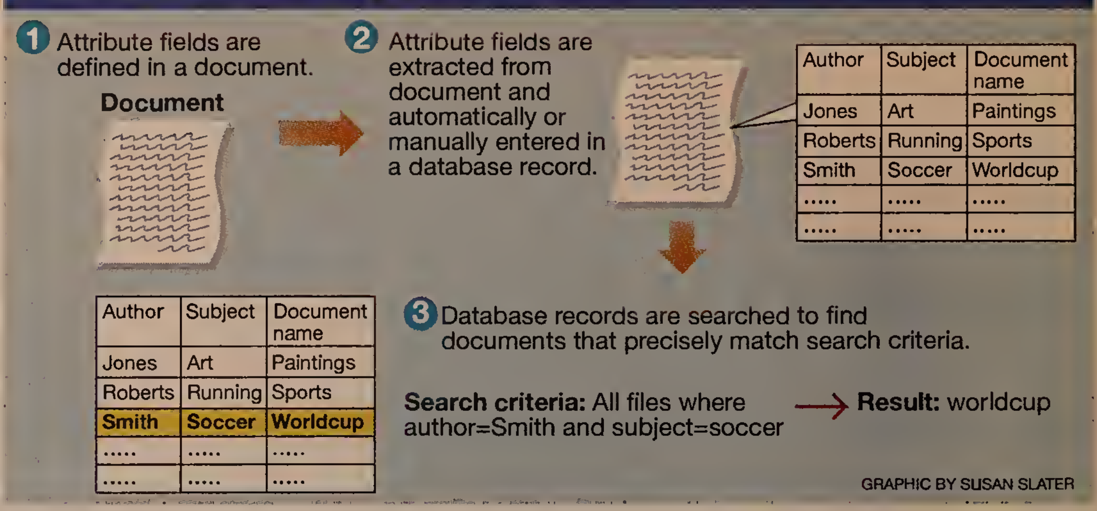

1 All words are extracted from each document. Insignificant words such as "the," "and," "but" and "that" are discarded.
Document
~~But~~ when ~~the~~ aardvark ~~that~~ was at ~~the~~ zoo arrived a little too late
2 The remaining words are listed alphabetically in a database file along with pointers to the documents that each appears in.
Index database file
Document pointer/name
aardvark → animal.zoo
abacus → calculator.num
abalone → mollusk.she
zoo → animal.zoo
zucchini → vegetable.foo
zuni → indian.tri
aardvark animal.zoo
abacus calculator.num
abalone mollusk.she
zoo animal.zoo
zucchini vegetable.foo
zuni indian.tri
3 Word list is searched to find the names of documents with specific words.
Search criteria: All documents containing "aardvarks" and "zoo"
Result: Animal.zoo

GRAPHIC BY SUSAN SLATER

The other major indexing method is an attribute index that follows the relational database model.

This method enables users to store such document attributes as an author's name, the date a document was created, the date it was last edited and the document topic in a database management system (see graphic, this page).

Indexing documents: attribute index


1 Attribute fields are defined in a document.
Document
2 Attribute fields are extracted from document and automatically or manually entered in a database record.
Author | Subject | Document name
Jones | Art | Paintings
Roberts | Running | Sports
Smith | Soccer | Worldcup
3 Database records are searched to find documents that precisely match search criteria.
Author | Subject | Document name
Jones | Art | Paintings
Roberts | Running | Sports
Smith | Soccer | Worldcup
Search criteria: All files where author=Smith and subject=soccer
Result: worldcup

GRAPHIC BY SUSAN SLATER

An attribute index typically makes use of an SQL DBMS such as those provided by Oracle Corp. and Sybase, Inc. or the DMS vendor's proprietary database.

End users can be asked to enter attribute information when they store a document, or DMS administrators can build software routines that automatically pluck required information from the document itself or the application used to create it.

Attribute index searches are carried out using the DBMS's query tools and bring back only those documents that meet the strict search criteria.

While searches of attribute indexes may be faster than those of inverted matrix indexes, the end user has less ability to search for exact text within a document.

However, an attribute index enables the end user to search for information that is not necessarily in the text of the document, such as the author's name.

Attribute index files tend to be smaller than full text inverted matrix files because much less information is being stored about each document. The indexing overhead usually stays within 10% of the size of all the documents.

However, the size of an attribute index file increases in direct proportion to the increase in the number of documents because each new document requires the creation of a new database record.

Interleaf, Documentum, IBM, PC Docs and Xsoft use both attribute and inverted matrix indexing. The advantage here is that users have far more options for locating files. For instance, a user can search for all the documents created within a specified time frame that also contain a certain phrase. The first part

Continued on page 42

DMS strategies of software's Big Three

The Big Three software houses — Novell, Inc., Lotus Development Corp. and Microsoft Corp. — have all outlined vastly different document management products and strategies. But in a pleasant change of pace, these industry-leading companies are offering complementary solutions, rather than competing head-on. They are sure to set de facto standards that many smaller vendors will agree to support.

Novell has announced plans for a document management architecture for open systems; Lotus provides document management capabilities through its Notes groupware platform; and Microsoft is leading the charge for document assembly with its new Object Linking and Embedding (OLE) technology, OLE 2.0.

NOVELL

Novell recently joined forces with Xerox Corp.'s Xsoft division at the NetWorld+Interop 94 conference last April to announce Document Enabled Networking (DEN), an architecture that will enable developers to build document management services and applications in NetWare and other environments. DEN-based applications will permit users of NetWare 4 to access electronic documents regardless of where they are stored or what application was used to create them.

DEN will run as a set of NetWare Loadable Modules for NetWare 4 servers with application program interfaces (API) to front-end applications running on clients and service provider interfaces to back-end services such as server-based directories.

By the end of 1995, Novell and Xerox plan to provide the initial DEN APIs and a software development kit to allow other vendors to develop both front- and back-end applications. While the initial implementation of DEN will be limited to NetWare servers and clients, the development partners have expressed plans to extend the architecture to support other network operating systems and non-NetWare clients, including Unix, UnixWare, OS/2 and Windows NT.

To date, only a few companies have committed to developing applications using the DEN framework — including SoftSolutions, Inc., a division of WordPerfect Corp. that has been acquired by Novell, and Xsoft. NetWare 4 customers seem to be encouraged by the direction, but DEN is stirring little excitement outside the NetWare arena at this time.

As a result of the recent Novell/WordPerfect merger, the Novell Applications Group finds itself with more than a document management systems (DMS) strategy; it is now shipping a DMS in the form of SoftSolutions, as well as work flow and electronic distribution technology embedded in WordPerfect Symmetry, formerly called WordPerfect Office.

LOTUS

Lotus' information integration strategy is based on its Notes groupware package and a communication architecture that uses messaging technology, distributed documents and access to relational database management systems. While many people, including those at Lotus, think of Notes as a DMS, it is really in a distinctly different category.

While Notes does have some strong document assembly, routing and search/retrieval capabilities, it is also an application development platform. Companies that get the most benefits from implementing Notes develop vertical market applications that meet their specific business needs. Typically, documents used by that application are stored in Notes format and distributed through Notes' routing and replication technology. Unless built into the application, documents are not specifically tracked via a version number or library metaphor.

But still, Lotus is helping its users in bringing document management capabilities to bear on business problems.

MICROSOFT

Microsoft is playing two behind-the-scenes roles in the document management arena. First, it is working with other vendors and standards committees to ensure that third-party products work properly with Microsoft products. For instance, Microsoft is working closely with SoftSolutions to ensure that Microsoft Word documents are fully compatible with the SoftSolutions DMS. Moreover, Microsoft is a member of the Shamrock Document Management Coalition, a group that is developing industry specifications for DMS interoperability.

Microsoft's second role is as a provider of strategic software technology for third-party developers. For instance, Microsoft's OLE 2.0 technology is used by many DMS developers in their products. OLE 2.0 enables developers to add sophisticated object-based document assembly functions to their products.

Further, Microsoft is purported to be including some minimal document management features into future versions of Windows. Eventually, users may begin to see client operating systems supporting more and more document management services, such as file saving and document versioning operations.

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Continued from page 40

of the search — the dates — comes from the attributes database, while the second part — the exact phrase — comes from the inverted matrix index file.

Some DMSs have a few distinguishing capabilities. For instance, IBM's Visual Document Library also supports multilingual searches, making the product a good choice for multinational companies that require foreign language support.

Documentum has support for a repeating attribute that, for example, makes it possible for users to search for all the documents that have multiple authors, such as a legislative bill. Documentum can offer this capability because its author attribute field can support multiple names instead of one, as is the case with most other DMSs.

More than 1 billion pages of output are generated daily in the U.S.

SOURCE: DELPHI CONSULTING, BOSTON

For instance, the author field of a Documentum attribute index record can contain the names Smith, Jones and Miller. This capability enables users to build a simple query that locates all documents authored by Smith or Jones because the DMS only searches one field.

By comparison, most other DMSs force users to create a separate field for each author, which tremendously complicates the way a query has to be built. For instance, to find the documents authored by Smith or Jones, the end user would have to build a complex query that searches each author field individually for the name Smith or Jones.

Salix Systems' DocStor and Odyssey Development's ISYS use full-text indexing and retrieval only. This reduces a user's ability to search for a file based on information that is not in the document text, such as the author's name or the creation date of the file.

Most DMSs perform instant indexing, which means changes made to documents are reflected in the index as soon as the document is stored. However, Odyssey Development's ISYS treats indexing as a scheduled task to be performed manually or at certain intervals during the day. On the one hand, delaying the indexing of document changes means end users don't have to wait to retrieve a document until the database is finished with its automatic reindexing. But on the other hand, some users will access out-of-date information.

There are more than 1.3 trillion documents sitting in U.S. business and government offices.

SOURCE: DELPHI CONSULTING, BOSTON

Uniquely, AskSam Systems chose not to utilize indexes in its DMS product, largely because of the storage overhead and time involved in using indexes. Instead, the company uses a proprietary search engine that accommodates rapid full-text searches on small data repositories. The firm claims it takes about 12 seconds to search an average 5M bytes of text. However, the search engine is really limited to workgroups of fewer than 20 people.

Lastly, Xsoft's Visual Recall has a unique way to display the results of a document search. The product uses two-dimensional and three-dimensional models and graphics to display document search results.

Tree and grid views similar to flow charts offer graphic representations of relationships between documents that met any of several search criteria, thus enabling users to hone in on a particular document meeting the exact search criteria. This obviates the need to examine each document to see which one best meets the overall search criteria.

CHECK IT OUT

Library management is another feature that separates the men from the boys in DMS products. Library management is used to log all documents into a catalog system and a file management system that are used to strictly control access and changes to documents.

In order to work with a document, users must check it out of the library. Similar to record locking for a database, if a document is already checked out, no one else can edit it. The document, however, can be viewed or copied by other users.

Document check-in/check-out is important for two reasons. First, it makes sure that only one person at a time can make changes to a document, thus preventing accidental overwrites. Second, it controls user access rights for editing, deleting, moving and copying files.

Another key library system feature is version control, which is used to track multiple versions of a document. Each time a document is checked back into the library, the old version is not overwritten. Instead, a new version is created and given a new version number.

Version control allows users to go back to previous versions of a document if necessary. Some products that don't have a formal check-in/check-out process, including Excalibur's EFS and Verity's Topic, do offer some level of version control. Low-end DMSs lack version control.

For users that need quick access to older versions of a document, version control can be a lifesaver. However, keeping multiple copies of documents puts a strain on disk space and often requires the use of file compression and automatic archiving.

Documentum has an extensive library management scheme, which includes check-in/check-out, version control and document archiving. Documentum permits an unlimited number of document versions in a nonlinear fashion. Using a branching scheme, each version of a document can have several releases. For instance, Version 1 of a document can be followed by Version 1.1.

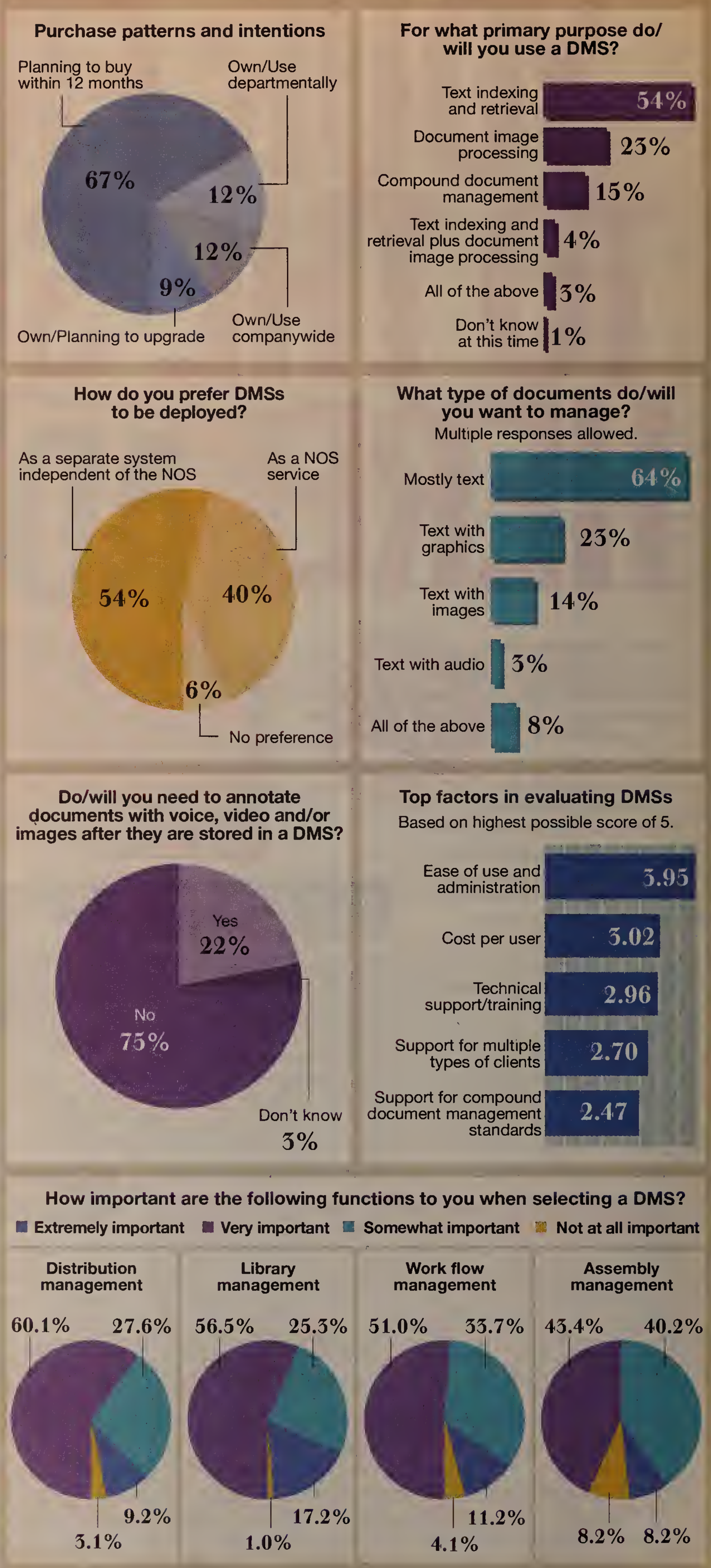
This version branching is helpful for companies that must maintain and update older documents such as operator manuals for several different models of the same machine. As improvements are made to earlier models, the operator manual for that model can be updated. The manufacturer can continue building new models and coming out with operator manuals for each one.

To conserve storage space, Documentum's DMS can archive old document versions to tape or optical media as well as compress files for on-line storage or delete them completely if they haven't been accessed for a specified period of time. These actions can be automatic or determined by the user or system administrator.

Interleaf's RDM and IBM's Visual Document Library also have full version control and document check-in/check-out features. An administrator can set parameters for automatic document archiving according to specified

Reader views on DMSs

Based on 100 interviews.



Focus Data, Inc., an independent market research firm in Framingham, Mass., conducted the survey. Focus Data specializes in gathering primary data from end-user organizations regarding their enterprise network environment and needs. For more information on Focus Data services, call Mona Dabbon at (508) 626-2556.

GRAPHIC BY SUSAN SLATER

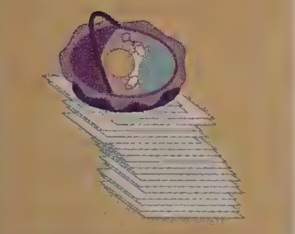
properties, such as date last accessed.

Xsoft's Visual Recall has a library with version control. What's more, after a document is checked into the library, it can be edited by an application other than the one used to create it. Visual Recall automatically does the file conversion. Most other DMSs require the creating application be used to edit a document.

PC Docs Open supports as many as 99 versions of a document, but the user has to initiate the creation of a new version by invoking a "save as" command. The document is saved with a new name and comments along with a new version number. Similarly, SoftSolutions permits as many as 99 versions and requires users to consciously create a new version.

Forcing users to create new versions is a bit more kludgy than using a higher end DMS that automatically creates new versions for the user because the likelihood of accidentally overwriting an old version is increased. Users sometimes forget to invoke the "save as" command and perform a "save" function on a document, which simply overwrites the document that was in use.

Each birth in the U.S. leads to the generation of eight four-drawer file cabinets of information.



SOURCE: DELPHI CONSULTING, BOSTON

Not all DMS products have a library system and formal version control. Those products that do not have these features assume that the network administrators or the users will make their own backup documents. These products also rely on the net to handle record locking to prevent multiple users from editing the same document simultaneously. Products that have no formal library system or version control include AskSam Systems' AskSam for Windows and ISYS from Odyssey Development.

SOME ASSEMBLY REQUIRED

DMSs can also be distinguished by their document assembly features, which enable the system to bring all the pieces that form a complex document together for display. High-end products track documents by treating them as composites of individual content objects. The other DMSs simply track files and treat a document as a whole rather than the sum of many parts.

Hard core publishers will take an interest in Interleaf's and Documentum's assembly functions. The other DMSs are better suited to users who are content to assemble their documents using Windows Object Linking and Embedding (OLE) or the other facilities provided in their document creation application.

Interleaf's RDM can work with another module known as Interleaf 6, which is the original Interleaf document publishing system. Interleaf 6 and RDM together offer superb capabilities for creating and managing the multiple pieces of a document.

Interleaf 6 is an object-oriented, high-end desktop publishing package used to create long and highly technical documents. The package lets users define processes that generate documents automatically rather than edit static page layouts. It is clearly geared toward organizations that generate long documents involving many authors across a heterogeneous net.

But Documentum is at least a year ahead of its competition in developing and implementing object technology. Documentum treats a document and the information inside it as two different types of objects. A document object has attributes such as title, author and subject. Then there are content objects that include text, images, video and other document elements that have their own attributes.

By treating content as separate objects, the same document elements can be easily combined and used in multiple documents. Documentum stores the object once and keeps track of its various versions and where it is used. This makes it easy to assemble large or complex documents.

This object orientation allows Documentum to support document-level transactions, with complete roll-back and commit features like a relational database offers. For example, an engineer needing to update four separate drawings with a new material specification only needs to kick off one update transaction. The DMS will attempt to update each drawing. If the update is not reflected in all four drawings, the DMS will cancel the transaction and

Continued on page 44

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Buyer's Guide

Continued from page 43

roll each drawing back to the previous version. The engineer is notified that the changes were not made and can then make another attempt.

Most of the other DMS products support document assembly through Microsoft Windows OLE and Dynamic Data Exchange applications. This is no different than the capabilities found in a word processing application. From within a document, the user chooses to embed or link to data in another application. This linkage creates a compound document.

This is about as sophisticated as document assembly gets for the mid-range and low-end DMSs. But given DMS's file orientation, it's good enough for the masses.

Document distribution is the last key differentiator among DMSs and is likely to become a hotly contested area in the features war as vendors improve their document distribution capabilities over the next six months to a year. DMSs will become tightly integrated with electronic mail applications, thus enabling users to move documents around the enterprise using an established E-mail backbone. Likewise, DMSs will make use of work flow technology to automate the movement of documents from one worker to the next.

Documentum already has a full work flow model in its DMS. Documents can be routed with a prescribed flow, as well as with an ad hoc assignment. For instance, all expense report documents can be routed to a manager for approval, then to a department head for signature and wind up in accounting for processing and payment. If the manager is on vacation for two weeks, ad hoc routing can be used to shuttle the expense report to the person filling in for the manager.

Documentum's work flow model is so good that other DMS vendors such as Verity recommend it for integration with their own products. Interleaf also has a good work flow model, focusing on the life cycle of a document, and it is commonly used for the document review process.

IBM Visual Document Library does not have its own work flow module, but it can integrate nicely with another IBM product called FlowMark. SoftSolutions uses a third-party work flow product from Reach Software Corp. However, now that SoftSolutions is a division of WordPerfect, there are plans to integrate SoftSolutions' DMS with WordPerfect Symmetry (formerly WordPerfect Office) work flow and E-mail capabilities.

Another aspect of document distribution is viewing capabilities that will enable documents created in one application to be displayed in read-only fashion by another. For instance, the DMS should have a facility that enables a document created using WordPerfect to be viewed on a client workstation running Lotus Development Corp.'s Ami Pro word processing application. The document may not be displayed with all of WordPerfect's fancy formatting but at least the text will be intact.

Interleaf's RDM works with the WorldView module of Intellecte to make it possible for text and graphic documents from virtually any source to be viewed on any computer.

Other DMSs solve the document viewing challenge by translating files or providing special viewer applications. Documentum relieves the user of the file translation burden by automatically translating documents from one native application to another.

Xsoft's Visual Recall solves the document viewing dilemma by including viewing software that can display documents created in any of 30 applications. PC Docs Open includes third-party viewers for major word processing and spreadsheet file types. Salix Systems' DocStor has minimal viewing capabilities, providing viewers for only GIF and TIFF files.

LOOKING AHEAD

The DMS market will soon see significant changes, mostly on the standards and interoperability fronts. Functional boundaries between products will just get fuzzier as the features war escalates and vendors match each other in the one-upmanship game.

Through openness and international standards, vendors will improve support for multiple networks, server platforms, and client types. This will inch the DMS industry toward that elusive and utopic environment of equality where it won't matter where a document comes from, what format it is in and what client workstation is used to display it.

In the meantime, users should define their requirements carefully, and shop around. Remember, a product not ready now may be worth another look in six to 12 months.

➻ Musthaler is vice president of research at Currid & Co., a Houston-based technology consulting firm. She can be reached at (713) 789-5995.

Kabay

Continued from page 33

usual troublesome nonsense of having to get permission from authors before quoting them. Your hard-nosed attitude towards intellectual property rights is a refreshing change from the usual mealy-mouthed bleatings about respect, civility and mutual cooperation in protecting the work of authors and publishers."

In the end, common decency requires that, regardless of the murky state of copyright in cyberspace, we should use our normal concern for privacy, respect for the creator of a text and common sense when using electronic data.

Incidentally, I have cheerfully taken advantage of this cyberspace cadet's lunatic views by quoting him without permission. I did not, however, choose to humiliate him by publishing his name. Despite his ostensible commitment to a piratical appropriation of intellectual property, I suspect he might sue me.

➻ Kabay is director of education with the National Computer Security Association in Carlisle, Pa. He can be reached on the Internet at 75300.3232@compuserve.com or by phone at (514) 695-4968.

Help desk

Continued from page 2

Unix-based machines? I am interested in software that is compatible with TCP/IP.

Tue Pham, New Orleans

Jonathan Wheat, a security consultant at the National Computer Security Association, a Carlisle, Pa.-based organization that promotes security awareness to microcomputer and network users, replies:

The only Kerberos vendor I am aware of is the developer, CyberSAFE Corp. (formerly Open Computing Security Group Financial Data Systems, Inc.). Their product, CyberSafe Challenger, provides third-party user authentication in an open computing distributed environment. It is available for the common Unix platforms as well as Windows, DOS and Macintosh. Single quantity pricing for the server component ranges from $2,800 to $4,800, the client component ranges from $95 to $120 and the tool kit costs $3,000. For more product information, call CyberSAFE at (206) 883-8721.

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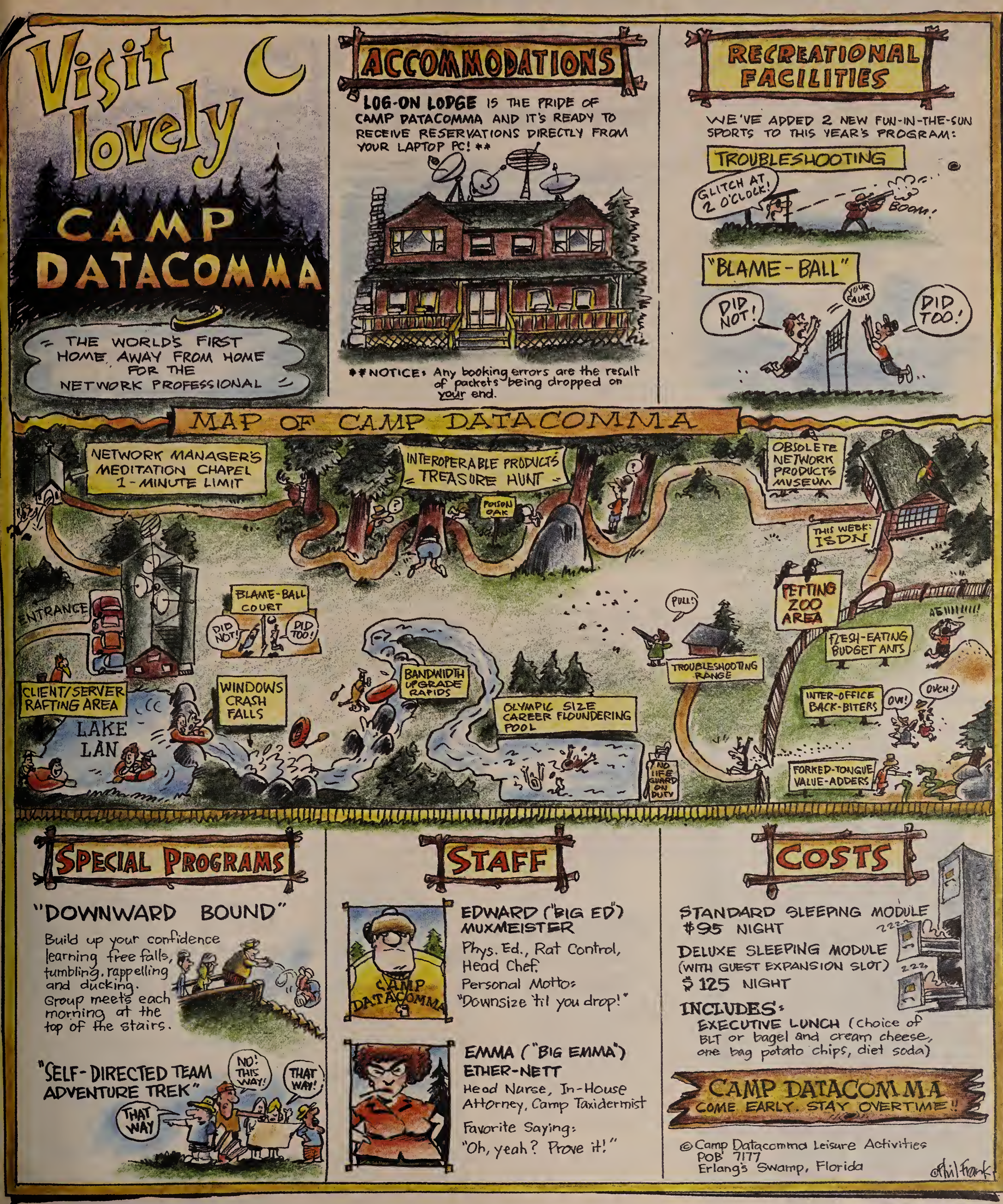
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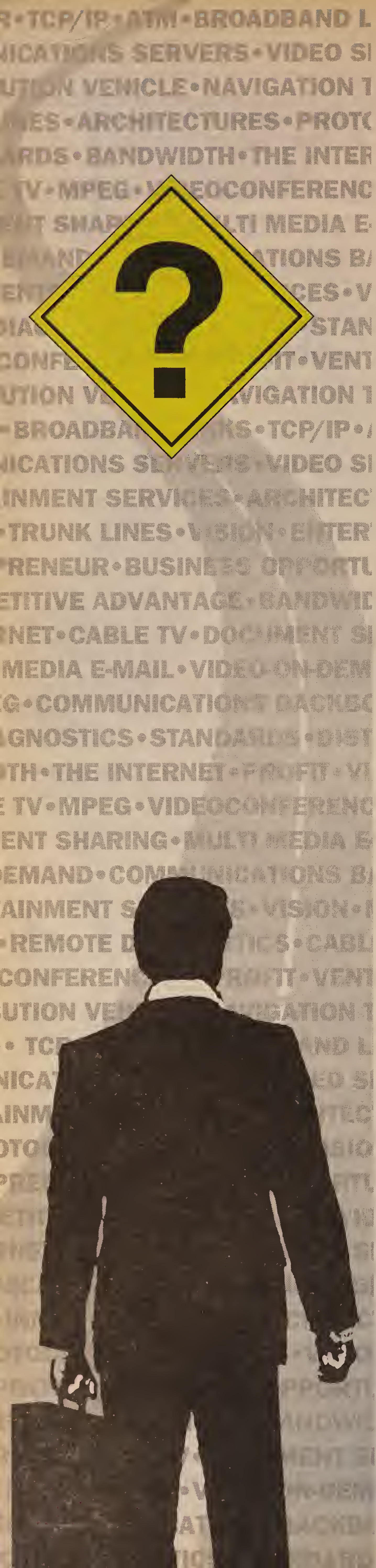

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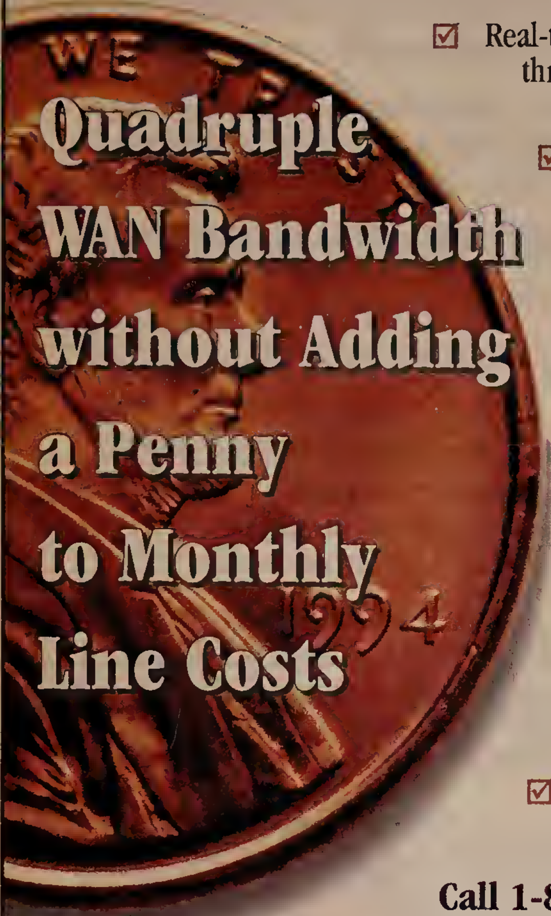

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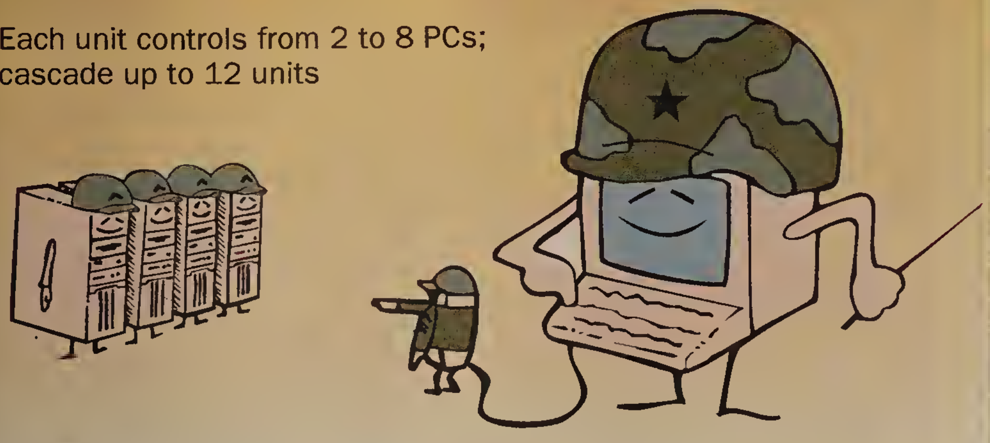

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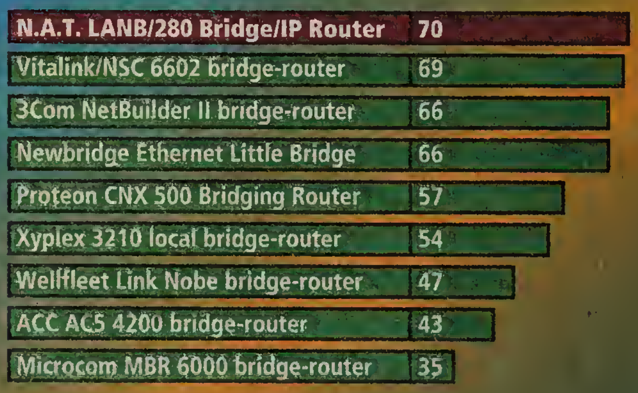

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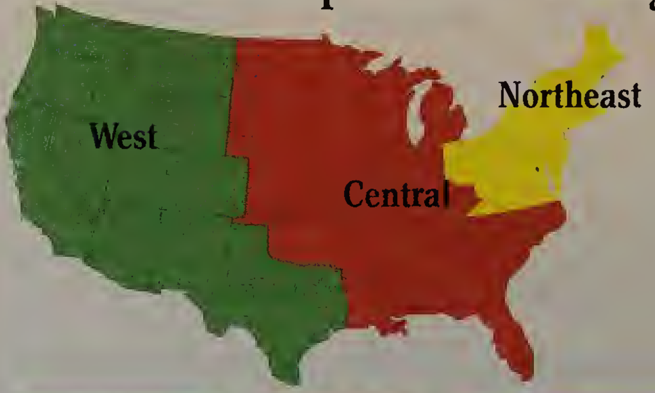

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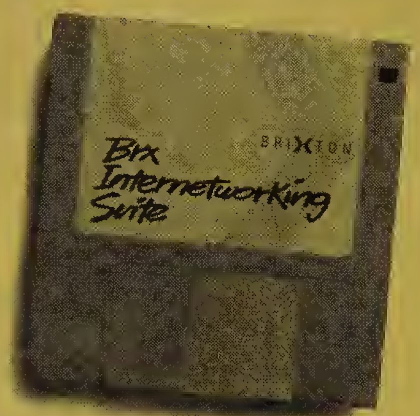

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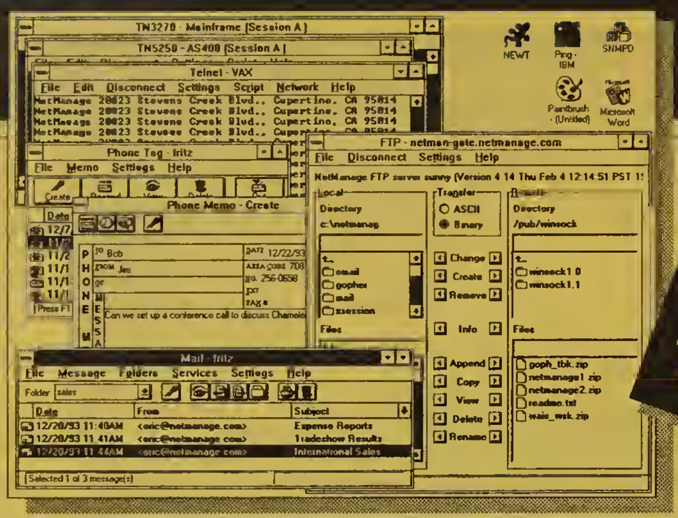

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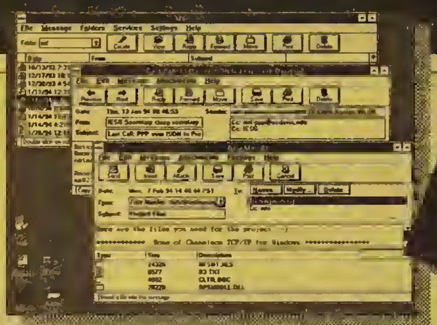

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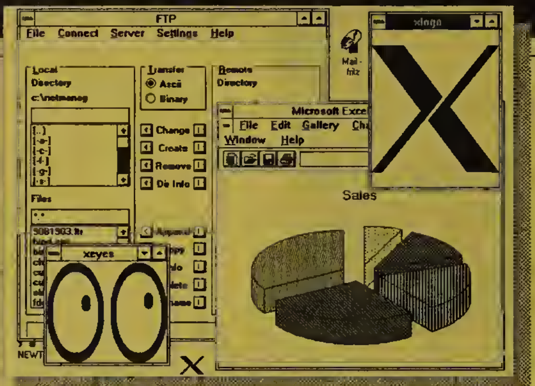

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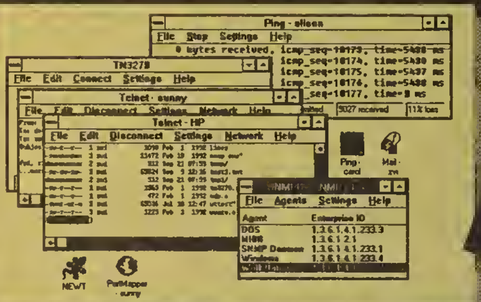

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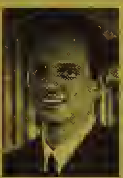

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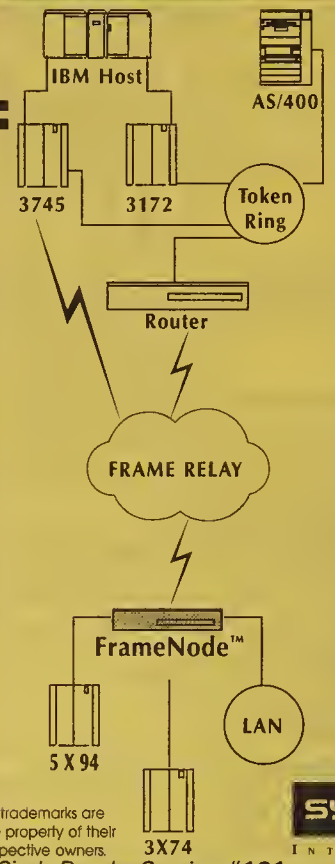

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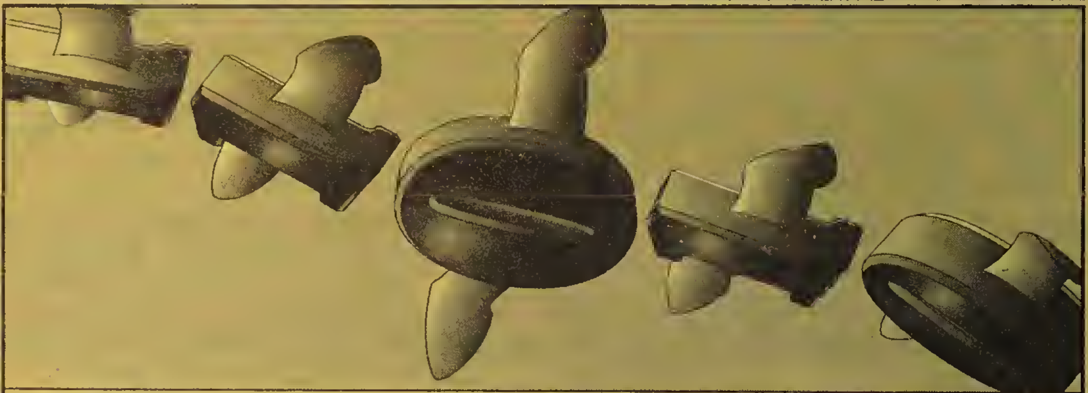

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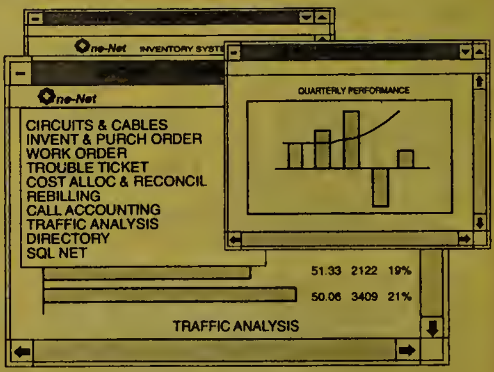

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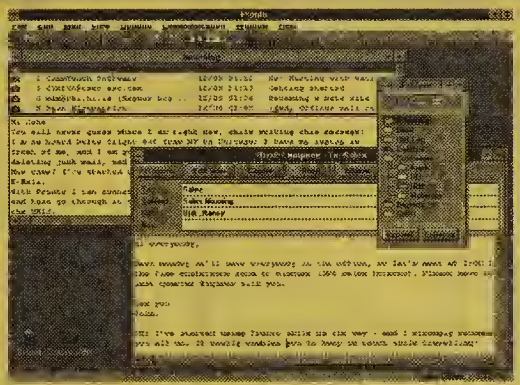

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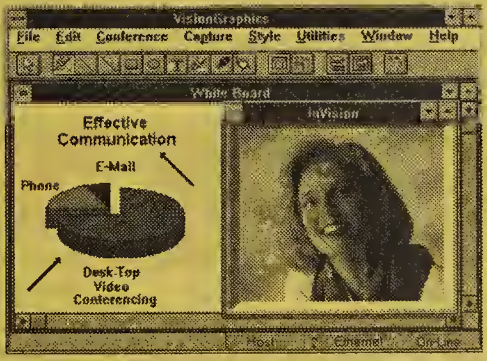
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In-box

Continued from page 1

dent for consulting and research at the Creative Networks, Inc. consultancy in San Francisco.

The final framework should enable users to access any type of message, including EDI, through a single interface. Opening a desktop in-box, for example, would make it possible to manipulate voice, fax and E-mail messages. Or users on the road could dial in to hear voice mail and E-mail put to sound.

The concept of a universal in-box is not actually new – Deborah Mills-Scofield of AT&T received a patent for an implementation a decade ago. More recently, Lotus Development Corp. released software that lets Notes users receive fax and voice messages through their Notes interface – or have their Notes messages read to them over the phone.

Novell, Inc. and its WordPerfect Corp. subsidiary have software to perform similar functions, while Microsoft Corp. has promised it for versions of Microsoft Mail due out next year.

But vendors in the different fields have yet to tie their standards together, raising concerns about how users would tie together products from vendors not working with each other.

"If the vendors can actually work together in a timely manner and deliver something like this, it would be a delight," said Hank Witek, E-mail program manager at Sandia National Laboratories in Albuquerque, N.M.

Larry Histon, director of information technology for roofing tile manufacturer Monier, Inc. in Orange, Calif., is all for such technology, saying it could cut equipment costs, no more stand-alone fax machines, and increase productivity.

"Anything that you can do that totally empowers [users], distributes functions, eliminates manual processes, would be a benefit to any worker," Histon said.

But John Murphy, director of telecommunications for The Travelers Corp. in Hartford, Conn., questioned the need, at least immediately, for such technology. "Nobody is clamoring for it" at Travelers, he said.

Each vendor approaches universal in-boxes differently. One basic architecture consists of clients that handle the message presentation connected to back-end message servers via agents or rules-based software. This software searches servers for messages addressed to an end user and then creates a database of pointers to the messages.

"Once I connect to you, Mr. Logical Unified Mailbox, go out and get my stuff," Mills-Scofield, director of strategic planning for AT&T EasyLink Services, said, explaining an ideal system.

FILTERING OUT THE NOISE

Universal in-boxes will require E-mail-like filtering tools for incoming fax and voice messages or risk drowning in an electronic sea of messages. "People have enough of a problem just filtering out E-mail," Murphy said.

Don Nanneman, group marketing manager at Octel Communications Corp. in Milpitas, Calif., said voice mail systems could be fairly easily integrated with existing E-mail filter systems to handle internal calls because phone systems already track the originating and forwarding extensions.

Ultimately, he said, voice mail vendors might work to integrate their own directory systems with those of E-mail vendors.

Users can expect to see some standards in place fairly quickly, predicted Ed Owens, director of technology relations for Lotus' cc:Mail.

"We'll all be working feverishly" to get specifications published, he said.

➡ Senior Writers Barb Cole, Kevin Fogarty and Joanie Wexler contributed to this story.

Hubs

Continued from page 1

plans, users can start with a five-slot PowerHub 7000 base unit and add three five-slot expansion units, thanks to the system's unique stacking design.

A fully loaded 7000 in this 20-slot configuration will support more than 200 switched Ethernet segments and as many as eight Fiber Distributed Data Interface rings, which is a far cry from the density of Alantec's existing PowerHub 5000 Series (see graphic, page 1).

Users add expansion units by removing the top cover of the base units and interconnecting the backplanes. The backplanes themselves can be swapped out for higher capacity, allowing the stack to scale from 1.6G bit/sec of total backplane capacity to 3.2G bit/sec.

Alantec declined to comment.

"The 7000 is going to be attractive to a number of users because it does not force a large up-front investment in a next-generation backbone device like the Cabletron [Systems, Inc.] MAC-Plus or SynOptics [Communications, Inc.] Lattis System 5000 does," said an industry analyst briefed by the firm. "Giving users a choice in slots and segments, as well as total capacity and performance, will let them tailor the device to their needs and not worry about filling up slots in a huge switching hub."

The 7000 base unit, which is based on a centralized dual-processor architecture, will support as many as 24 switched Ethernet segments with 10M bit/sec of dedicated bandwidth. It will also support two switched FDDI connections, which can offer dedicated 100M bit/sec pipes to server clusters or other mission-critical network resources.

The switching hub's 1.6G bit/sec backplane comprises two 800M bit/sec packet channels. The on-board processors forward packet traffic and choose which channel the traffic will be switched across via an automatic load-balancing feature.

Customers can add two additional processors to the mix via a packet accelerator daughtercard that attaches via a motherboard expansion slot to double the hub's processing power.

Like its 5000 predecessor, the 7000 will offer software-based integrated local bridging and routing, with throughput ranging from 60,000 to 800,000 packet/sec, depending on configuration.

Four interface modules will be initially available with the 7000, including:

- **Universal Ethernet Card** — A six-port module that supports six Ethernet nets via 10Base-T, 10Base2, 10Base5 or 10Base-FL interfaces.
- **Private Ethernet Card** — A 16-port 10Base-T module that supports 16 segments.
- **Microsegmented Ethernet Card** — A module that supports four Ethernet segments with either four or six 10Base-T ports per segment.
- **FDDI Card** — A two-port module that supports one or two independent dual counterrotating FDDI rings.

The firm is also expected to announce future support for both Asynchronous Transfer Mode and 100M bit/sec Ethernet through the 7000, although support for token-ring switching is not in Alantec's near-term plans.

"I don't know if token-ring support is worth it for Alantec right now. It has more important things to focus on, such as bulking up its [sales] channels and working within the confines of its R&D budget," said Tam Dell'oro, senior analyst at Dataquest, Inc., a consultancy in San Jose, Calif. "While the high level of consolidation we've seen in the industry lately poses some big challenges to Alantec, the LAN switching market is big enough for it to survive and succeed. User demand for this technology is just incredible."

According to another analyst familiar with Alantec's plans who requested anonymity, Alantec must better address some net management issues.

"The biggest hole in its new architecture is the weakness of its net management offering," he said. "It has plans to port its PowerSite Manager to the major platforms by the fall, which will help, but the application itself needs to be more robust."

The 7000 switching hub and the Private Ethernet card will be available this month, with the FDDI capabilities to follow in September. The microsegment and universal modules as well as the packet accelerator card and expansion units will be available in the fourth quarter.

An entry-level 7000 with six Ethernet segments will cost $19,400, while 18 Ethernets with two FDDI rings is priced at $46,430. A 7000 configured with eight FDDI rings will cost $86,200. ◼

Reality ✓ Check

Product: ForeRunner ASX-200

Company: Fore Systems

The benefits:
- Campus backbone and WAN models
- UNI 3.0 and Q.2931 support
- Redundant power supplies and hot-swappable modules
- Larger output buffers

The drawbacks:
- Nonblocking limited to 40 ports
- Only 2 priority levels
- Few third-party ATM applications

The user view:

"With support for UNI 3.0, we're assured of switched virtual circuits that will interoperate with other vendors' switches."

– Scott O'Hare, Network Systems Designer, Cablevision

Fore

Continued from page 1

hanced version of Fore's existing ASX-100 workgroup ATM switch that supports two to 24 ports, has hot-swappable modules and supports WAN links. The ASX-200BX provides the same features but offers redundant power supplies for use in small campus backbones.

The ASX-200BXE, which offers all the features of the BX, is designed for larger backbones, providing up to 96 ports, but it only offers complete nonblocking for as many as 40 ports.

For carriers, Fore offers the ASX-2000 WANswitch, an Asynchronous Transfer Mode edge switch. It comes preconfigured with 16, 24 or 40 ports. Carriers can extend the capacity to 64 ports, but at the sacrifice of the switch's nonblocking architecture. That might not be an issue though since analysts do not give Fore a chance with carriers.

For one, it is too expensive. "The $80,000 price tag on the WANswitch is just too high," said Jennifer Pigg, a program director at The Yankee Group, a Boston-based consultancy. "Newbridge [Networks, Inc.'s] switch, for example, costs around $50,000."

Like its predecessor, the ASX-200 family is based on a time-division bus, an architecture analysts criticized in the past as not being able to scale well to higher port densities. The architecture was also thought to be expensive to scale up since interconnecting multiple switch modules to make bigger boxes meant dedicating some ports to linking switches.

Since the ASX-200 family is only nonblocking up to 40 ports, and the WANswitch is priced above similar switches already on the market, there appears to be some credibility to that earlier criticism.

David Passmore, president of Decisis, Inc., a consultancy in Herndon, Va., dismisses the former fascination with switch architecture. "Too much emphasis is placed on switch fabrics," he said. "We should really focus on the way bandwidth is allocated."

Fore, however, has taken the lead in offering switches based on industry standards, which is highlighted by the new UNI support. UNI 3.0 is an implementation specification from the ATM Forum that dictates how to build switched virtual circuits in compliance with the forum's Q.2931 signaling standard, ensuring that different switches interoperate.

It also specifies traffic policing rules, including use of Dual Leaky Buckets, an algorithm that automatically monitors and manages switch bandwidth usage to prevent net congestion. Other congestion control features are 512-cell output buffers at each port and a second priority level for traffic.

"The buffer size is significantly higher than what Fore was offering in the ASX-100, and higher than any other switch in this class," said Val Sribar, a senior research analyst at the META Group, Inc. consultancy in Westport, Conn.

INTERFACE SUPPORT

All the Fore switches, whose capacity ranges from 2.5G to 10G bit/sec, support a variety of LAN and WAN interfaces, including: T-3/E-3, the ATM Forum's 100M bit/sec Transparent Asynchronous Transmitter/Receiver Interface and 155M bit/sec SONET OC-3.

All of the switches, which can be managed by Fore's ForeView net management application, are available now. The ASX-200 starts at $21,950, while the ASX-200BX and ASX-200BXE range in price from $39,950 to $100,000. The ASX-200 WANswitch costs between $87,950 and $199,950.

©Fore: (412) 772-8686.

BILL O'CONNELL

"We're not too concerned about the Wellfleet/SynOptics merger [in terms of being an ATM competitor] since it will be at least 18 to 24 months before it delivers a product.

- Joseph Skorupa

Sizing up ATM pricing

Prices for sample network configurations.

Sprint

Locations linked	Configuration (hub)	PVC rate (M bit/sec)	Price per month**** (in thousands)
Chicago-Los Angeles	Point-to-point	4	$49.6*
Chicago-Los Angeles-New York	Ring	4	$74.4
Boston-New York-Washington, D.C.	Star (New York)	7	$87
		34	$105**
Chicago-New York-San Francisco	Star (Chicago)	7	$87
		34	$105**
Boston-Dallas-New York-Philadelphia-San Francisco	Star (Dallas)	7	$145
		34	$174

MFS Datanet

Locations linked	Configuration (hub)	PVC rate (M bit/sec)	Price per month**** (in thousands)
Boston-Washington, D.C.-New York	Star (New York)	7	$18
		34	$30***
Chicago-New York-San Francisco	Star (Chicago)	7	$63
		34	$125***
Chicago-Dallas-New York-Philadelphia-San Francisco	Star (Dallas)	7	$110
		34	$230

*Excludes access changes.

**Includes DS3 local access.

***Includes local access.

****Prices do not include term or volume discounts.

SOURCE: TELECHOICE, INC., VERONA N.J.

ATM

Continued from page 1

The network uses a 45M bit/sec, variable-bit-rate ATM link to connect Eugene and Portland. Each month, port charges run from $18,000 to $25,000, permanent virtual circuit costs run $27,500, and network access is another $10,000.

"Add it up; it's pretty steep," said David Meyer, a senior network engineer with Oregon University who works on the project.

In fact, it is much more expensive than a comparable private line. For a 109-mile T-3 private line, WilTel charges $20,000, according to Christine Heckart, a former WilTel manager and now an analyst with TeleChoice, Inc. in Verona, N.J. WilTel's actual price would be even lower thanks to term and volume discounts. Bottom line, no one pays full price for a T-3, Heckart said.

Local ATM service is much more reasonable. On the West Coast, Pacific Bell charges a flat rate of $4,850 per month for its 45M bit/sec service and $7,899 for 155M bit/sec circuits. Those are the only speeds currently available, but Pacific Bell expects to have 1.5M and 622M bit/sec services available by the middle of next year.

GTE plans to launch local ATM services in Hawaii and North Carolina next month. Although the carrier will offer a flat-rate price, service prices will be tariffed by state. GTE's price for 45M bit/sec service will be $3,000 to $5,000 per month; 155M bit/sec service will cost $4,000 to $8,000.

Long-distance carriers should emulate that aggressive local pricing, Heckart said. By cutting prices dramatically, the interexchange carriers could tempt users to put more than a few applications on the ATM network, she said.

"It's like water: If water costs a lot of money — like DS3s do today — you're only going to use water for drinking," Heckart said. "If ATM is going to explode, it needs to be . . . inexpensive enough that you can wash your car or wash your dog with it."

Unfortunately, long-distance carriers are still pricing ATM like voice, multiplying miles by circuits to compute prices, Heckart said. But the rise of optical networks has made bandwidth cheaper, and ATM lets bandwidth be shared more flexibly, so those old pricing models do not make sense anymore.

From the user perspective, ATM is an improvement over private lines because it simplifies network construction by enabling a single connection into the ATM cloud to support connectivity to multiple remote locations.

But for the near term, users are still likely to judge ATM using the same metrics that led them to adopt their current T-1 or T-3 lines, said Arthur Henley, an analyst with Telecom Technologies, Inc. in Richardson, Texas.

"I don't think the flexibility of ATM is going to be enough to cause people to move at this time," Henley said. "Given that there are no killer applications for ATM, you've got to look at what the customer always looks at first, and that's price/performance."

Instead of modeling ATM prices on voice contracts, long-distance carriers should be using flat-rate or per-cell pricing schemes, Heckart said.

Henley goes even further, predicting the demise of both custom contracts and the local carrier's flat rates. Customers may be comfortable paying a fixed fee, but carriers eventually will have to charge larger users more for the service.

Senior Editor Joanie Wexler contributed to this story.

Frame relay

Continued from page 1

than the lower speed, analog leased lines because of frame relay's distance-insensitive pricing.

One analyst pointed out another advantage to frame relay for pure SNA traffic: "There is currently uncertainty about how users should determine appropriate-speed CIRs," taking into consideration some "free" bandwidth users can get when bursting into spare net capacity, said David Passmore, president of consultancy Decisis, Inc. in Herndon, Va.

But because of the steady nature of SNA traffic, the bursting factor is not as important, so "you can look at frame relay as a leased-line replacement based purely on economics."

WEIGHING THE SHIFT

U.S. Marine/Bayliner has centralized most of its information resources in its headquarters here. What was two months ago a 13-site analog net of dedicated 9.6K and 19.2K bit/sec links (see graphic) is now a public WilTel net that lets the manufacturing plants share application software, inventory information, payroll data, ship reports and invoices.

In its evaluation of frame relay service from WilTel, AT&T and some value-added network service providers, U.S. Marine/Bayliner determined that the pricing structure plus the ability to provision new links quickly made it worth the shift.

"With a dedicated network, I would have to pay a lot more to change a line speed," said Barry Patterson, technical support analyst and project manager for the wide-area network. And provisioning new leased lines can take a month or more.

"To move our 16K bit/sec [permanent virtual circuits] to 32K bit/sec will cost less than a couple hundred [dollars] a month," he said, "and it's done in a couple of hours."

The company might elect to bump up PVC speeds down the road if it decides to implement LANs at its nationwide sites and fold that traffic onto the net.

U.S. Marine/Bayliner turned to WilTel over AT&T, its former service provider, because WilTel was more consistent with its pricing data from early on, Patterson said.

"AT&T was wavering for two to three months; we would get a quote, then something would come up and the quote would change."

NOT ALL ROSY

While net response time has improved on average of one second per transaction, Elting has discovered that WilTel's ability to recover from natural disasters does not match AT&T's.

"Our statistics show a noticeable increase in duration of network outages," Elting said, which have all been due to local loop failures for which the interexchange carrier serves as a customer liaison.

Patterson chalked the situation up to AT&T's having more clout with local carriers and more manpower. "Where AT&T might have cleared up a situation in two hours, it might take WilTel four," he said.

There have been other pitfalls. The company originally tried to use the least expensive frame relay assembler/dissassembler (FRAD) — which converts premises traffic to frame relay — to keep costs down. The device, from FastComm Corp., was said to support SNA, "but we had terminals locking up, garbage running across the screen, and we were burning [erasable programmable read-only memory]," Patterson said.

He said he opted to pay more for Motorola Network Systems Division's 6520 FRADs, which he can upgrade to a LAN router for less than $2,000 should the need arise. The company invested about $100,000 in frame relay gear, for which it expects a payback within two years, Patterson said.

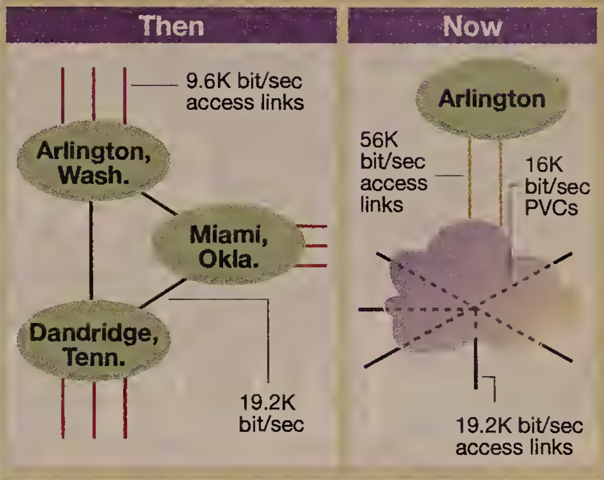
If and when U.S. Marine/Bayliner brings LAN traffic onto the net, the issues of prioritizing delay-sensitive SNA and LAN protocols will likely arise, said Christine Heckart, senior consultant at TeleChoice, Inc. in Verona, N.J.

The Motorola 6520 deals with this in a couple of ways, said Nav Chander, Motorola product marketing manager.

It first minimizes congestion by allowing Synchronous Data Link Control traffic to run natively, as opposed to encapsulating it in higher level protocols such as IP, which causes congestion-generating overhead.

If congestion does occur, he said, the device allows users to give SNA traffic priority over other protocols or to share bandwidth based on a predetermined percentage.

Leased-line replacement



Why U.S. Marine/Bayliner swapped nets:

- More than 30% savings on line costs.
- Response times improved by average of 1 second.
- PVCs are inexpensive and easy to upgrade.

GRAPHIC BY SUSAN SLATER

NETWORK WORLD

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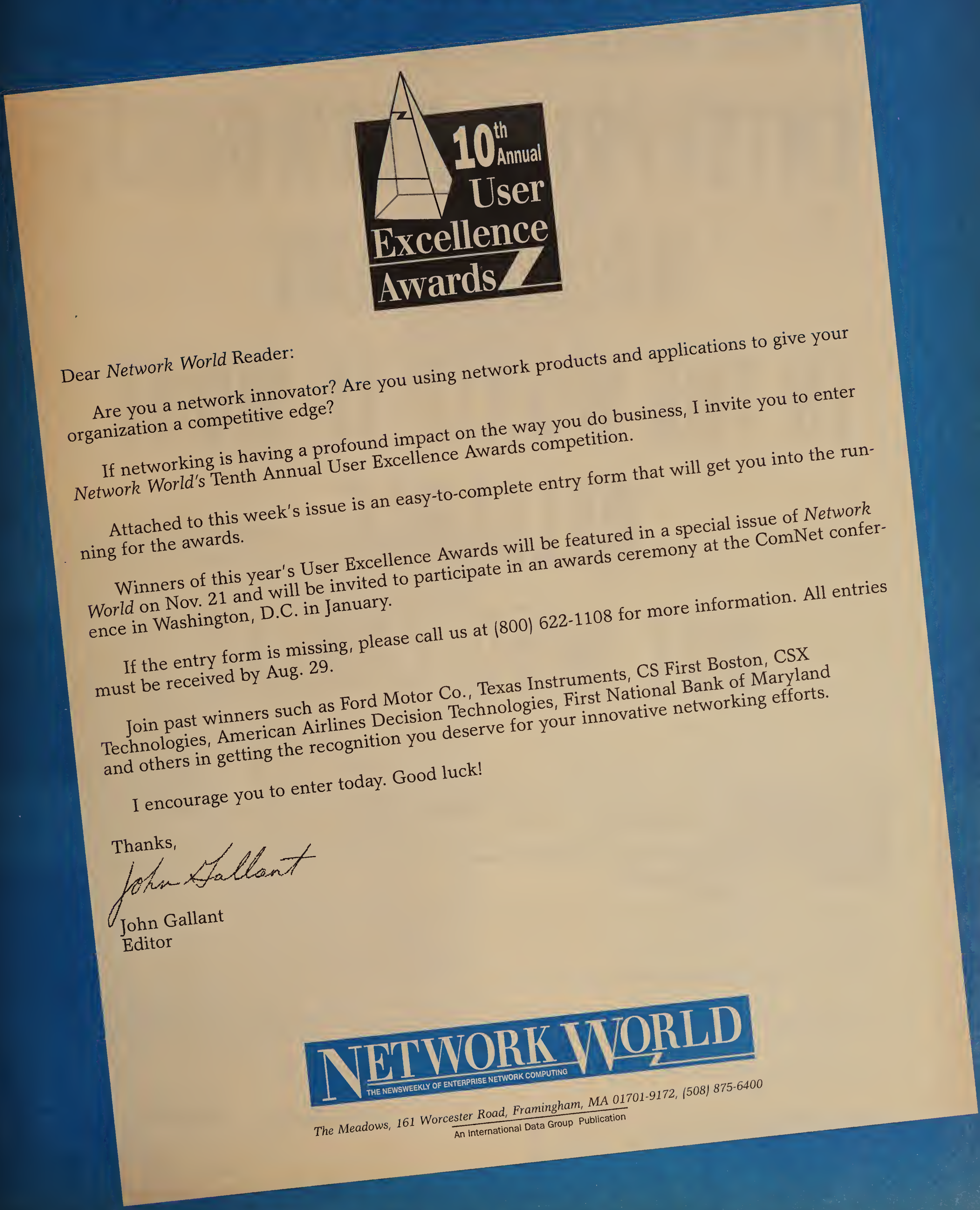

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Attached to this week's issue is an easy-to-complete entry form that will get you into the running for the awards.

Winners of this year's User Excellence Awards will be featured in a special issue of *Network World* on Nov. 21 and will be invited to participate in an awards ceremony at the ComNet conference in Washington, D.C. in January.

If the entry form is missing, please call us at (800) 622-1108 for more information. All entries must be received by Aug. 29.

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I encourage you to enter today. Good luck!

Thanks,

John Gallant

John Gallant
Editor

NETWORK WORLD
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Please submit a 250- to 500-word abstract explaining how networking has helped your organization achieve its strategic goals. How has networking helped you differentiate your products and services from competitors or launch new offerings? How has it enabled you to bring new products and services to market more quickly? How has it helped you reduce your operating costs? How have technologies such as electronic data interchange helped you build closer working relationships with customers, suppliers and other business partners?

The size of your network isn't important; what matters is how networking has helped your company achieve its objectives. Only entries submitted by users will be considered. No vendor-supplied customer nominations please.

Please print your abstract on a separate sheet and return it with an entry form via MCI Mail (390-4868), via the Internet (network@world.std.com), by facsimile at (508) 820-1103 or by mailing your entry to: User Excellence Committee, *Network World*, 161 Worcester Road, Framingham, Mass. 01701.

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